

ALBERTA

**DEPT. OF
LANDS AND
MINES**

**ANNUAL
REPORT**

1932-40

HD
319
A4
A329
3d-10th
1932/33-
1939/40

SCI

Ex libris
UNIVERSITATIS
ALBERTAENSIS



Universal Bindery Ltd.
BOOKBINDING - GOLD LETTERING
Edmonton, Alberta

ANNUAL REPORT
OF THE
Department of Lands and Mines
OF THE
PROVINCE OF ALBERTA
FOR THE
Fiscal Year ended March 31, 1933

PUBLISHED BY ORDER OF THE LEGISLATIVE ASSEMBLY



EDMONTON:
PRINTED BY W. D. McLEAN, KING'S PRINTER
1934

UNIVERSITY
OF ALBERTA LIBRARY

Oct 24 1933
112400

*To the Honourable W. L. Walsh,
Lieutenant-Governor of the Province of Alberta.*

SIR:

I have the honour to submit herewith the report of the Department of Lands and Mines for the fiscal year ended March 31st, 1933.

I have the honour to be, Sir,

Your obedient servant,

R. G. REID,
Minister of Lands and Mines.

EDMONTON, October 23rd, 1933.

2250802

TABLE OF CONTENTS

	Page
REPORT OF THE DEPUTY MINISTER	9
I—PROVINCIAL LANDS ADMINISTRATION	
Report of the Edmonton Land Agency	28
Calgary Land Agency	30
Lethbridge Land Agency	32
Peace River Land Agency	33
Grande Prairie Land Agency	35
II—TECHNICAL DIVISION	
Report of the Technical Division	37
III—GRAZING	
Report of the Supervisor of Grazing	41
IV—PETROLEUM AND NATURAL GAS	
Report of the Director of Petroleum and Natural Gas.....	44
V—FORESTRY	
Report of the Director of Forestry	74
VI—FISHERIES	
Report of the Director of Fisheries	133
VII—ACCOUNTING DIVISION	
Report of the Acting Accountant	149

CHIEF OFFICERS,
DEPARTMENT OF LANDS AND MINES

March 31st, 1933

Honourable R. G. Reid.....	<i>Minister of Lands and Mines</i>
John Harvie	<i>Deputy Minister of Lands and Mines</i>
T. C. Rankine	<i>Departmental Solicitor</i>
D. H. Boles	<i>Director of Lands</i>
W. Calder	<i>Director of Petroleum and Natural Gas</i>
T. F. Blefgen	<i>Director of Forestry</i>
R. T. Rodd	<i>Director of Fisheries</i>
A. A. Millar	<i>Chief Inspector, The Coal-mines Regu- lation Act</i>
I. N. McKinnon	<i>Acting Accountant</i>
J. W. Stafford	<i>Agent, Edmonton Land Agency</i>
M. Gossip	<i>Agent, Calgary Land Agency</i>
R. Cruickshank	<i>Agent, Lethbridge Land Agency</i>
A. B. Spence	<i>Agent, Peace River Land Agency</i>
J. J. E. Clarke	<i>Agent, Grande Prairie Land Agency</i>
R. J. Dean	<i>Inspector of Revenue</i>
F. W. Neilson	<i>Chief Timber Inspector</i>
T. W. Dalkin	<i>Technical Division</i>
A. Helmer	<i>Supervisor of Grazing</i>
J. L. Irwin	<i>Statistician</i>

REPORT

OF THE

Department of Lands and Mines

1932-33

*Honourable R. G. Reid,
Minister of Lands and Mines,
Edmonton.*

SIR:

I have the honour to submit the third annual report of the Department of Lands and Mines for the fiscal year ended March 31st, 1933.

The information as detailed throughout the following pages will evidence the fact that during this year there was little change in the industrial and economic situation as it affected this Department.

It will be noted in the Accountant's section of the report that there exists a decrease of \$52,242.91 in comparison with last year's figures regarding the question of surplus on income account, the surplus this year standing at \$289,616.15 as compared with \$341,859.06 for the preceding period.

There are, however, a few improvements in the general situation which are noticeable. Interest collections on school lands, for instance, show an appreciable increase of \$104,024.21 over last year. Lumber manufactured from timber cut on licensed and permit berths together with timber sales on forest reserves report a fairly substantial increase. This particular improvement is largely due to the fact that exhaustion of carry-over supplies in retail yards, which existed towards the end of the previous year, created the necessity for operators to replenish their stocks on hand. The report on petroleum production, though showing a decrease, discloses at the same time the prospect of a much wider development programme in the near future regarding the output of crude oil.

PROVINCIAL LANDS ADMINISTRATION

School Lands Purchases.—An amendment to The Provincial Lands Act, favourable to holders of school lands on sales contracts, which was under arrangement towards the close of the fiscal year, became effective in April, 1933. This amendment gave to the holders of such lands, who had become seriously in arrears in the matter of principal and interest, a prior right of giving up their sales contracts originally secured from the federal Government and retaining the land under a cultivation permit of one year, renewable for still another year following which a six-year lease would be granted which in turn would be renewable at expiration for a similar

period, such lease being on a crop share basis with an annual rental of four cents per acre on uncultivated area.

Purchased Homesteads and Pre-emptions.—A further amendment, enacted at the same time as the aforementioned after being given consideration during the period of this report, gave to the holders of purchased homesteads and pre-emptions, who had also got into arrears, the option of surrendering their sales contracts secured under federal administration, and obtaining the land by entry as first or second homesteads by payments of the ordinary fees and compliance with the usual regulations covering residence and improvement duties.

Homestead Entries.—First and second homestead entries and soldier grants during the year reached a total of 3,499 covering an area of approximately 559,840 acres as compared with 4,428 entries and soldier grants with an approximate acreage of 708,480 during the previous fiscal year. The total of 3,499 for this year comprises 3,112 first homesteads, 358 second homesteads and 29 soldier grants. Homestead entries granted to women reached a total of 976 which figure is included in the first homestead total of 3,112. With reference to this last figure showing total of first homesteads, 480 persons had held previous entries which had been cancelled prior to their re-entry in new locations.

The total of 3,112 persons to whom first homestead entries were granted, added to their wives, children and dependents, comprised a grand total of 9,147 souls. Of these, 3,074 (33.60 per cent.) were of Canadian nationality, 967 (10.57 per cent.) were from Great Britain and British Dominions, 1,627 (17.78 per cent.) from the United States, and 3,479 (38.03 per cent.) from other countries, chiefly European.

The total of 3,112 first homestead entries granted during this period, shows a decrease of 764 in comparison with last year's total of 3,876. Likewise the total of 9,147 souls, comprising the persons making first homestead entries together with their wives, children and dependents, shows a decrease of 3,022 from last year's total of 12,169. One of the principal reasons for this decrease was due to the fact that the area in the Calgary and Lethbridge districts south of Township 42 was restricted from settlement. This restriction which was started in September, 1931, continued throughout this period.

Trend of Settlement.—The trend of settlement during the year was in the northern portion of the Edmonton Land Agency district and generally throughout the Peace River area. Homestead entries in the district of the Peace River Agency considerably exceeded, as in the previous year, those of the Grande Prairie Agency. Again, as in the previous year, homestead entries granted to women were more numerous in the two northern districts than elsewhere in the Province.

Statements showing totals of homestead entries and soldier grants together with statistical summary of nationalities for the first three years following the transfer of the natural resources to the Province are given herewith. Fuller details of this information appear in the Annual Reports for these different periods.

HOMESTEAD ENTRIES GRANTED

Fiscal Year	Homesteads	Second Homesteads	Soldier Grants	Total	Homesteads Granted to Women
*1930-31	3,042	557	149	3,748	.....
1931-32	3,876	522	30	4,428	1,521
1932-33	3,112	358	29	3,499	976
TOTALS.....	10,030	1,437	208	11,675	2,497
Decreases this year in comparison with last	764	164	1	929	545

*Six months to March 31.

NOTE.—Homesteads for women were not available until 1932. The total number as shown in the above statement is included in the first homestead total.

STATISTICAL SUMMARY OF NATIONALITIES

FISCAL YEAR	CANADA		GREAT BRITAIN AND BRITISH DOMINIONS			UNITED STATES		OTHER COUNTRIES		TOTAL	
	Number of homestead entries	Number of Souls	Number of homestead entries	Number of Souls	Number of homestead entries	Number of homestead entries	Number of Souls	Number of homestead entries	Number of Souls	Number of homestead entries	Number of Souls
*1930-31	1,088	2,184 (30.89%)	261	620 (8.77%)	386	948 (13.41%)	1,307	3,317 (46.93%)	3,042	7,069	
1931-32	1,649	4,559 (37.46%)	393	1,238 (10.17%)	733	2,664 (21.89%)	1,101	3,708 (30.47%)	3,876	12,169	
1932-33	1,237	3,074 (33.60%)	300	967 (10.57%)	456	1,627 (17.78%)	1,119	3,479 (38.03%)	3,112	9,147	
TOTALS.....	3,974	9,817 (34.53%)	954	2,825 (9.96%)	1,575	5,239 (18.46%)	3,527	10,504 (37.00%)	10,030	28,335	

*Six months to March 31.

THIS YEAR IN COMPARISON WITH LAST

Decrease		Decrease		Increase		Decrease	
Decrease	Decrease	Decrease	Decrease	Decrease	Decrease	Decrease	Decrease
412	1,485	93	271	277	1,037	18	229

NOTE: Number of souls includes persons to whom first homesteads were granted together with their wives, children and dependents.

WORK OF THE TECHNICAL DIVISION

Issue of Notifications.—The issuance of notifications covering school lands required for right of way purposes by the Northern Alberta Railways Company has been started, these rights of way being included in the sale of provincial-owned railways. The plans have now been received and recorded, but certain information is still required from Ottawa regarding confirmation of the valuation of these tracts. The revision of rights of way of other railways has been effected from time to time, necessitating the recording of new plans and rectifying of titles by the issue of new notifications.

The detailed checking of all homestead entries regarding reservations for railway rights of way, roadways or other patented sections of land was made and the land agencies notified accordingly.

New Surveyed Roadways.—In connection with the reservation of lands required for new surveyed roadways in open Crown lands, considerable correspondence has been transacted between the Technical Division and the Surveys Branch of the Department of Public Works, in which 166 plans affecting a large number of parcels of land have been recorded.

Records.—Applications for leases covering recreational grounds and exhibition sites have been dealt with and in some cases issued. Applications dealing also with power transmission lines, pipe line rights of way and sites of various kinds have also been given necessary attention.

Free grants of land, which had previously been made for religious purposes, have been disposed of in certain instances, it was discovered, for uses other than originally intended. In such cases compensations have been paid to this Department and the release of the habendum clauses issued.

A considerable amount of work has been entailed in connection with tax recovery lands transferred to this Department by the Department of Municipal Affairs. Plan records are now in process of being made covering the various titles, copies of which will be sent to the provincial land agencies.

Dominion of Canada lands have been cancelled into the name of the Province. Patents for Soldier Settlement Board lands are still issued by the Dominion Government, but records in all cases are kept of such patents and particulars of these reservations are sent to Ottawa.

The retention by the Dominion Government of certain lands in the Province at time of transfer of the natural resources has been noted, details of such areas having been delimited upon plan records.

Statistical Maps.—Statistical maps giving complete data on a variety of subjects bearing relationship to the general administration of the Department have been prepared. Plans, sketches and tracings have also been made for record purposes and for departmental use covering leases, surveys and other specialized areas.

Surveys made for this Department have been almost negligible during this period with the exception of the squatter situation in Drumheller where a survey was made and the location of all buildings obtained.

Areas of different types of lands and their usages together with water areas throughout the Province are given in statistical information which has been prepared.

NOTIFICATIONS ISSUED		
Fiscal Year	Notifications	Acres
*1930-31	23	3,019.71
1931-32	784	111,424.478
1932-33	1,260	178,887.233
TOTALS.....	2,067	293,331.421
Increases this year in comparison with last	476	67,462.755

*Six months to March 31.

GRAZING

No definite action on applications for grazing lands was taken by the Dominion Government during the period in which the question of the transfer of the natural resources to the Province was pending. After the transfer, many of these applications were of long standing and had become affected by changed conditions which necessitated their being closely investigated.

Applications for the lease of revested lands in the dry areas have in the past few years been numerous. So numerous have they become that a certain delay in dealing with them has been unavoidable, particularly as revested lands offer more complications than unattached Crown land areas.

Drought Conditions.—Drought conditions in recent years have seriously checked the growth of grass. With a reduced water supply, over-grazing, particularly in districts near water, has been evidenced. Over-grazing destroys the growth of nutritious grasses and replaces them with weeds. In spite of this danger, however, the cattle country has carried on, though ranchers have been apprehensive of the handicap under which they have been compelled to operate.

Preparation of Stock for Market.—Much of the future welfare of the Province depends upon the growth of grass, one of the most important of all crops. The stock situation at present is such that cattle markets demand a grain finished product, an undertaking only possible for farmers on more valuable land. Skill in breeding and the furnishing of proper types ready for such finishing on farms belong, however, solely to the rancher. This can only be accomplished in any sufficient number on low priced grazing lands. The rancher or producer of today must be an expert working in co-operation with the feeder who prepares the product for market.

Amongst the revested areas now under grazing lease there are many which were formerly broken or cultivated. This has lessened the value of the grass cover very considerably, and many years of favourable seasons are required to improve this situation.

APPLICATIONS AND RENEWALS FOR GRAZING LANDS	
Fiscal Year	
1931-32	741
1932-33	259
TOTAL.....	1,000
Decrease this year in comparison with last	482

SOIL SURVEYS

With the exception of a few minor land reconnaissances under the supervision of the Department of Soils, University of Alberta, no definite soil survey was carried out in the Province during the period of this report.

PETROLEUM AND NATURAL GAS

The projection of new work in the petroleum and natural gas industry of Alberta towards the close of this period, indicated the possibility of a long awaited and favourable change which would affect the development of these resources. Prior to this, in sympathy with the world-wide stagnation of commercial activities, the industry has marked time for a lengthy period.

Home Production of Crude Oil.—A general betterment in petroleum development conditions will have been reached when it is appreciated that Alberta's imports of crude oil, which approximate one million barrels yearly, may be largely offset by the increase of home production. Crude oil exists in remunerative quantities in certain sections of the Province. The realization that its recovery does not demand the risk of extraordinary capital for individual wells and that such exploitation can be carried out on a profitable basis should result in considerable oil development for the future.

Turner Valley Gas Conservation Board.—The creation of the Turner Valley Gas Conservation Board was effected in April, 1932, with a view to the continuation and completion of the tests previously carried out by the Petroleum and Natural Gas Division. With the assistance of a staff of six engineers who were continuously employed on these tests, the work of the Board was duly completed. A copy of the Board's findings, shown as Exhibit A, appears further on in this report in the Petroleum and Natural Gas section. These findings, which confirmed the initial data procured by the Petroleum and Natural Gas Division, contained also an entire survey of past operations in Turner Valley and made recommendations for future efficient development.

The pro rating recommendations made by the Board in its report were strongly protested by the operators, particularly the independents, at two meetings held, one in Calgary and one by the Agricultural Committee of the Provincial Legislature in Edmonton.

After hearing the operators' views it was decided that no useful purpose would be gained by continuing the tests at public expense. This resulted in the decision that future operation of the field would be in accordance with provincial regulations, subject to the cancellation of the temporary measure which prohibited the drilling of new wells to the limestone. In addition to this, the volume of gas allowed to be drawn from each well was to be increased to forty per cent. in lieu of the twenty-five per cent. as previously specified and the enforcement of regulations respecting the installation of meters was to be carried out.

Necessity for Conservation of Pressure.—It is now generally realized that a continuance of the wasteful methods, which in the

past have dissipated so great a volume of gas and many hundreds of pounds of useful pressure, would be seriously detrimental not only to the future of the field, but also to the success of operations at present in force.

A very useful underground pressure still exists in Turner Valley, and its use on an economic basis will insure a natural propellant for forcing naphtha to the surface. The necessity for its preservation as an economical means of production and as opposed to the alternative of exorbitant and prohibitive expenses which would be incurred by mechanical means is most apparent.

Decline in Production.—A marked decline in total oil production during this period is shown by the comparative statement which follows. Naphtha decrease is principally attributable to the increasing dryness of gas obtained from the older operated wells which strongly emphasizes the contention that future production along the lines of reduced waste is a vital necessity. Only by such consideration can naphtha-producing life of Turner Valley wells be prolonged. The decline in light crude oil is largely due to decreased drilling operations for this particular commodity.

PETROLEUM PRODUCTION				
Fiscal Year.	Naphtha (barrels)	Light crude oil (barrels)	Heavy crude oil (barrels)	Total (barrels)
*1930-31	1,496,457	104,183	13,562	1,614,202
1931-32	1,143,875	86,000	16,453	1,246,328
1932-33	810,958	52,238	7,886	871,082
TOTALS.....	3,451,290	242,421	37,901	3,731,612
Decreases this year in comparison with last	332,917	33,762	8,567	375,246

*Under federal administration to October 1st, 1930, and under provincial following that date.

Prospects for Crude Oil Production.—The decreases as shown in the above statement should be remedied in the near future, as a renewal of interest is beginning to be apparent regarding production from crude oil horizons, which should improve the situation. The plugging back of older deep wells to these shallower horizons is also anticipated. Added to this, there is a realization of the decreased operating costs for this form of recovery, all of which factors combine towards the prospect of an early increase in the production of light crude.

The abandonment of producing wells at Ribstone is partly due to the reduction in heavy crude oil. This abandonment is regretted as there was ample evidence that the operation of these particular wells could have been carried on with a profitable revenue from such activity. The same situation occurred at Wainwright, where operations were at a standstill. With each well separately owned there is a real need in this district for some form of single management to ensure economical development in that area.

Athabasca Oil Discovery.—Oil discovery of importance was made during this year near Athabasca. The thickness of the oil sand was considerable, and if found persistent over a large area, this new field may become one of major interest and lead to considerable drilling in that district. Present development of the discovery is postponed, however, as the operating company decided to drill the first well deeper to explore other horizons.

Gas Development.—In gas development, the only work of importance was the completion of two wells at Kinsella. These producers have confirmed the existence of gas in considerable volume and pressure over a large area, and are similar to the discovery well drilled by the Duluth Syndicate.

Examination of Strata Samples.—It was necessary during this period to considerably reduce the examination of strata samples on account of staff curtailment which resulted in complete examinations being made only in new areas.

Graphic Chart.—Included in the Petroleum and Natural Gas section of this report is a graphic chart of oil and gas operations in Alberta and a general statement giving progress of individual wells in the different fields of the Province which are shown under the headings of Exhibits C and D, respectively.

NATURAL GAS CONSUMPTION		Cubic feet
Fiscal Year		
*1929-30	.....	23,228,637,000
†1930-31	.....	23,312,006,000
1931-32	.....	18,327,139,000
1932-33	.....	16,061,383,000
TOTAL.....		80,929,165,000
Decrease this year in comparison with last.....		2,265,756,000

*Under federal administration.

†Under federal administration to October 1st, 1930, and under provincial following that date.

FOREST SERVICE

One of the freest seasons from fires which has ever been known since forest protection was first instituted in the Province was experienced this year. In reduced numbers of fires and, as a result, reduced totals of losses, together with a general reduction in the cost of fire suppression, the season proved to be a most satisfactory one.

Timber Industry.—Timber industry, though not extensive in size, was nevertheless noticeable in the number of small operations which took place and which kept inspectors busy. An easier year from the viewpoint of forest protection, added to changes in organization which introduced additional work in the matter of timber inspection during this period, enabled these particular inspections to be properly carried out on lands outside the boundaries of the reserves.

Unemployment Camps.—Unemployment relief camps were continued on a medium scale in two of the forest reserves. The work has been practically continuous since the fall of 1930, the number of camps varying from year to year.

Area of Forest Reserves.—An approximate area of 162,234.69 square miles is now taken up by the forest reserves of the Province. This figure is made up as follows:

	Square Miles
Cypress Hills and Rocky Mountains forest reserves	14,409.69
Northern Alberta forest district	147,825.00
TOTAL.....	162,234.69

The greater percentage of area within the boundaries of the reserves is absolute forest land, and therefore suitable only for the growing of trees. The practice of forestry in its various branches is therefore the first concern throughout these districts, and protection in the matter of fire prevention and fire suppression is particularly emphasized as a result.

Northern Alberta Forest District.—The Northern Alberta forest district, however, presents a different situation. Many land areas in this large territory are suitable for agricultural purposes though bearing at the present time stands of timber in varying stages of growth. Again, a large percentage is useful only for the growing of trees, and is in need therefore of protection in fire prevention and suppression. Similar protection is equally needed for those tracts now covered with valuable timber stands, but which eventually will be suitable for agriculture.

In an area as immense as this particular district, presenting as it does the dual problems of forest protection and agricultural development, the situation is one of great responsibility.

The encroachment of settlers upon the borders of timbered tracts is of necessity an element of danger to the timber. In the general process of settlement, it is perhaps only natural that there should be a lack of forest consciousness. The problem points to the encouragement and assistance of the settler without doing so at the expense of endangering the safety of a very necessary and extremely valuable natural resource.

Number of Fires.—Fires during the year numbered 379, which burned over an area of 136,117.89 acres, of which 68,253.42 acres were non-forested lands. Total loss of timber amounted to \$160,151.31, with a total cost in fire suppression of \$18,811.55.

SUMMARY OF FIRE LOSSES WITHIN ALBERTA FOREST RESERVES

Period	Number of fires	Cost of Suppression	Area (In acres)	Salvable timber (M. f.b.m.)	Salvable timber (Cords)	Unsalvable timber (M. f.b.m.)	Unsalvable timber (Cords)	Total Loss
October 1, 1930 to March 31, 1931.....	9	\$ 551.67	41,925	.....	.....	2.00	129.00	\$ 71.69
April 1, 1931 to December 31, 1931.....	31	17,824.12	52,218.05	2,370.5	3,086	6,293.73	111,599.00	154,851.47
January 1, 1932 to December 31, 1932.....	32	3,491.04	2,553.75	8.00	15,863	3,845.00	1,005.60	8,790.73
TOTAL.....	72	\$ 21,666.83	54,315.725	2,378.5	18,949	10,142.73	112,733.60	\$ 163,513.89

SUMMARY OF FIRE LOSSES OUTSIDE ALBERTA FOREST RESERVES

October 1, 1930 to March 31, 1931.....	47	\$ 686.64	11,145.19	155.00	.....	3.75	.....	\$ 79,950.85
April 1, 1931 to December 31, 1931.....	591	82,088.89	552,658.07	134,536.00	104,199	122,690.5	684,625.5	712,835.79
January 1, 1932 to December 31, 1932.....	347	15,320.51	133,562.14	274.75	12,215	40,627.15	132,743.00	152,085.58
TOTAL.....	985	\$ 98,096.04	697,365.40	134,965.75	116,414	163,321.40	817,368.50	\$ 944,872.22

SUMMARY OF FIRE LOSSES WITHIN AND OUTSIDE ALBERTA FOREST RESERVES

October 1, 1930 to March 31, 1931.....	56	\$ 1,238.31	11,187.115	155.00	.....	5.75	129.00	\$ 80,022.54
April 1, 1931 to December 31, 1931.....	622	99,713.01	604,876.12	136,906.5	107,285	128,986.33	796,224.5	867,487.26
January 1, 1932 to December 31, 1932.....	379	18,811.55	136,117.89	282.75	28,078	44,472.15	133,748.60	160,876.31
TOTAL.....	1,057	\$119,762.87	752,181.125	137,344.25	135,363	173,464.13	930,102.10	\$1,108,386.11

FORESTRY REVENUE

Fiscal Years	*1930-31	1931-32	1932-33	Total	This year in comparison with last	
					Increase	Decrease
Timber permits	\$ 6,159.32	\$ 9,358.17	\$ 6,096.73	\$ 21,614.22	.....	\$ 3,261.44
Timber seizures	5.00	105.46	23.80	134.26	.....	81.66
Timber sales	18,416.68	16,809.66	9,748.78	44,975.12	.....	7,060.88
Grazing permits	3,416.79	10,394.88	12,098.99	25,910.66	\$ 1,704.11	.....
Hay permits .....	.....	264.25	208.00	472.25	.....	56.25
Fishing permits .....	.....	1,342.25	1,087.50	2,429.75	.....	254.75
Surface rentals	1,631.84	1,813.21	1,971.28	5,416.33	153.07	.....
Miscellaneous use permits .....	.....	818.08	805.90	1,623.98	.....	12.18
Sundry revenue	218.98	2,622.90	721.35	3,563.23	.....	1,901.55
TOTAL.....	\$29,848.61	\$43,528.86	\$32,762.33	\$106,139.80	Net Decrease	\$10,766.53

*Six months to March 31.

NOTE.—In 1930-31 year, timber permits, \$6,159.32, and timber sales, \$18,416.88, are included in Annual Report for that period in total under the heading "timber permits, sales, etc."

In 1931-32 year, timber sales total of \$16,809.66 includes application and guarantee deposits. Sundry revenue total of \$2,622.90 includes sale of maps. These items are shown separately in Annual Report for that period.

Forest Nursery.—Since the fall of 1931 a successful forest nursery has been in operation at the Oliver farm near Edmonton. It was started by the moving of spruce and pine stock, developed to the transplanting stage, from the Cooking Lake forest reserve to Oliver.

The planting of approximately 4,550 four-year-old lodgepole pine, 2,700 four-year-old larch, 59,200 four-year-old white spruce and 175,000 two-year-old white spruce was put into effect. About half of this stock will be ready for distribution in the spring of 1934 with a small quantity available at an earlier date.

In response to over 1,000 applications, which were mostly received from farmers throughout the Province, approximately 700,000 caragana plants were distributed during this period from the Oliver farm.

Grazing on Forest Reserves.—Grazing on forest reserves during the year was most satisfactory. A large area was used to capacity, and south of the Crowsnest Pass a local demand for sheep range was developed. North of the Bow river valley there is range to accommodate a large number of livestock, but this territory at present, due to prevailing conditions of the livestock industry is partially or wholly unutilized.

Fiscal Year	FOREST RESERVES		GRAZING REPORT			
	Number of Permits	Revenue	Number of Horses	Number of Cattle	Number of Mules	Number of Sheep
*1930-31	92	\$ 3,717.75	1,600	5,346	1	.....
1931-32	456	10,394.88	3,417	15,041	....	4,379
1932-33	606	12,098.99	3,377	20,086	....	7,465
TOTALS.....	1,154	\$26,211.62	8,394	40,473	1	11,844
<hr/>						
	Increase	Increase	Decrease	Increase		Increase
This year in comparison with last	150	\$ 1,704.11	40	5,045	....	3,086

*Six months to March 31.

Lumber Manufactured.—Lumber manufactured from timber cut by holders of licensed and permit berths on provincial lands totalled 45,375,413 feet, board measure, to which there was added 277,631 feet, timber procured from school lands berths, whilst timber cut from timber sales on forest reserves scaled 2,372,779 feet, board measurement.

The increase of 8,813,343 feet over last year, shown in the following comparative statement under licensed and permit berths, is due principally to the exhaustion of carry-over supplies from previous years which created the necessity for the re-stocking of lumber yards.

In the same statement, under the heading of timber cut from timber sales on forest reserves, a large increase of 1,564,779 feet is shown. It will be noted that this year's total is similar to the six months period of 1930-31, but that between these periods there is a considerable decrease for 1931-32. The explanation is due to the fact that operations were very small in 1931-32, but in 1932-33 new sales were opened up and some of the old ones were again operated.

LUMBER MANUFACTURED

Fiscal Year	Licensed and permit berths on provincial lands (F.B.M.)	School lands berths (F.B.M.)	Timber cut from timber sales on forest reserves (F.B.M.)
*1930-31	20,002,746	627,534	2,849,528
1931-32	36,562,070	1,454,022	808,000
1932-33	45,375,413	277,631	2,372,779
TOTALS.....	101,940,229	2,359,187	6,030,307
	(Increase)	(Decrease)	(Increase)
This year in comparison with last	8,813,343	1,176,391	1,564,779

*Six months to March 31.

FISHERIES

The absence of any change in economic conditions continued to adversely influence the disposal of commercial fish for export during this period. Angling conditions, however, were good and trout fishing in the various streams of the Province was carried out with satisfactory catches.

Commercial Production.—Commercial fishing showed a reduction of 682,766 pounds representing a drop of \$21,488.35, value to fishermen, and \$59,119.37, value as marketed. Prices were unsatisfactory, and it was a most difficult year for the trade. Heavy competition in lake trout production from the Great Lakes almost eliminated the eastern market, which resulted in Lake Athabasca fishing being kept down to a minimum. Lesser Slave Lake, ranking second in the Province as a commercial producer of whitefish, also showed heavy reductions, indicating that little can be hoped for general production on a satisfactory commercial basis until market conditions improve.

A change for the better, however, in local demands helped a little to offset losses in the export trade. At the Edmonton Exhibition a display of provincial food and game fish was shown, which resulted in a noticeable interest being taken and local dealers had difficulties in filling orders. With a radio and lecture campaign, planned in co-operation with the federal Department of Fisheries, to follow, there is every reason to hope, pending a change in the economic situation, that the chief factor to assist commercial fishing will be the increased demand of local markets.

Domestic Fishing.—A decrease in domestic fishing licenses is also shown for this period which may be partly attributable to general conditions and partly to free angling allowed to residents of the Province for certain classes of fish. Free permits for Indian fishing showed an increase. Occasional trouble was experienced by Indian agents in controlling the holders of such permits within the limits of regulations governing these privileges.

Angling.—Angling was especially good in the trout streams of the foothills and also in the Edson district. Favourable reports were received from both areas regarding results obtained from the stocking of rainbow trout.

Irrigation.—Irrigation schemes were carried out with the usual precautions taken by the Fisheries Division in preventing loss of fish. In this particular every co-operation was afforded by the

Water Resources Branch of the Government. Little difficulty was experienced, regarding pollution of waters, from the operations of the Forestry and Petroleum and Natural Gas Divisions.

Restocking.—Restocking of lakes and streams with game fish from the federal hatcheries of Banff, Waterton and Jasper was carried out successfully in co-operation with the federal Department of Fisheries, the National Parks Branch and the superintendents of the hatcheries.

Arrangements for next year's operations have been made whereby an increased number of game fish eggs, at less cost to the Government through closer co-operation, will be planted. This will mean the liberation of 2,650,000 trout fry into provincial waters during the season to follow.

Speckled trout fry will also be planted for the first time in Cold Lake next summer. This innovation, which is to be carried out in co-operation with the Government of Saskatchewan and the Cold Lake Board of Trade, will add very materially to the sporting reputation of that water.

At the Lesser Slave lake whitefish hatchery towards the close of the fiscal year there were 122,000,000 eyed eggs. These eggs and resultant fry are to be disposed of at the beginning of the new season in Whitefish, Newell, Buck and Lesser Slave lakes.

During September and October the fall collection of whitefish eggs for the hatchery was put into effect at Lesser Slave and Whitefish lakes, resulting in 168,000,000 eggs being secured.

Twenty lakes or small bodies of water were examined during the season with a view to their suitability for fish. Sixteen were discovered to be barren and four to contain fish-life. In addition to these examinations, twenty-two additional lakes were stocked for the first time with game or commercial fish. A further allotment of Loch Leven fry was also liberated into Wabamun and Birch lakes with a view to continuing the experiments which should determine as to whether or not this class of fish would exist with pike, perch and whitefish.

TOTAL AMOUNT OF FISH TAKEN BY ANGLING

Fiscal Year.	Game Fish (Trout, Rocky Mountain white- fish and Arctic grayling)	Other Fish (Goldeyes, pick- erel, perch and pike)	Total
	lbs.	lbs.	lbs.
*1930-31 .....	.....	1,225,000	1,225,000
1931-32	457,975	1,756,919	2,214,894
1932-33	422,638	1,260,034	1,682,672
TOTALS.....	880,613	4,241,953	5,122,566
Decreases this year in com- parison with last	35,337	496,885	532,222

*Six months to March 31.

TOTAL AMOUNT OF FISH OF ALL CLASSES TAKEN ON DOMESTIC LICENSES

Fiscal Year	Weight (lbs.)
*1930-31	113,200
1931-32	547,078
1932-33	458,000
TOTAL.....	1,118,278
Decrease this year in comparison with last	89,078

*Six months to March 31.

DEPARTMENT OF LANDS AND MINES

TOTAL AMOUNT OF FISH OF ALL CLASSES TAKEN ON FREE
INDIAN PERMITS

Fiscal Year	Weight (lbs.)
*1930-31	1,130,000
1931-32	736,000
1932-33	860,000
TOTAL.....	2,726,000
Increase this year in comparison with last.....	124,000

*Six months to March 31.

NOTE.—The decrease in Indian permits for the year ending March 31st, 1932, as compared with the preceding year, is due to the withdrawal of these privileges to half-breeds. This became effective on October 1st, 1930, the date on which the natural resources of Alberta were transferred to provincial control.

TOTAL AMOUNT OF FISH TAKEN FOR COMMERCIAL PURPOSES AND
ITS VALUE

Fiscal Year	Weight (lbs.)	Value to Fishermen	Value as Marketed
*1930-31	1,851,848	\$ 70,624.00	\$ 94,032.00
1931-32	3,337,980	115,928.10	189,927.88
1932-33	2,655,214	94,439.65	130,808.51
TOTALS.....	7,845,042	\$280,991.75	\$414,768.39
Decreases this year in comparison with last	682,766	\$ 21,488.45	\$ 59,119.37

*Six months to March 31.

TOTAL AMOUNT OF FISH OF ALL CLASSES TAKEN BY ANGLING AND NETS

Fiscal Year	Angling (lbs.)	Domestic fishing (lbs.)	Indian fishing (lbs.)	Commercial fishing (lbs.)	Total (lbs.)
*1930-31	1,225,000	113,200	1,130,000	1,851,848	4,320,048
1931-32	2,214,894	547,078	736,000	3,337,980	6,835,952
1932-33	1,682,672	458,000	860,000	2,655,214	5,655,886
TOTALS.....	5,122,566	1,118,278	2,726,000	7,845,042	16,811,886
This year in comparison with last	Decrease 532,222	Decrease 89,078	Increase 124,000	Decrease 682,766	Decrease 1,180,066

*Six months to March 31.

SUMMARY OF CONFISCATIONS AND PROSECUTIONS FOR INFRACTIONS
OF FISHERIES REGULATIONS

Fiscal Year	Confiscations	Prosecutions
*1930-31	29	27
1931-32	40	68
1932-33	68	89
TOTALS.....	137	184

*Six months to March 31.

FISH CULTURE—COLLECTION OF WHITEFISH EGGS FOR
LESSER SLAVE LAKE HATCHERY

Fiscal Year	Eggs Collected
*1930-31	147,225,000
1931-32	148,200,000
1932-33	168,000,000
TOTAL	463,425,000
Increase this year in comparison with last.....	19,800,000

*Six months to March 31.

FISH CULTURE—PLANTING OF FISH FRY INTO PROVINCIAL WATERS
OUTSIDE THE NATIONAL PARKS

Fiscal Year	Game Fish (trout)		Whitefish
	Number of plantings	Number of fry	Number of fry
*1930-31 .....	.....	.....	.....
1931-32	157	2,236,500	114,440,000
1932-33	147	1,960,250	101,700,000
TOTALS.....	304	4,196,750	216,140,000
Decreases this year in comparison with last	10	276,250	12,740,000

*Six months to March 31.

NOTE.—During the year 1932-33, 20,400,000 eyed whitefish eggs were planted in provincial waters for hatching, which offsets the decrease, shown above, of whitefish fry liberated.

EXAMINATION AND STOCKING OF LAKES AND OTHER BODIES OF WATER

Fiscal Year	Lakes and other bodies of water examined regarding suitability for stocking	Number found suitable	Number found unsuitable	Lakes and other bodies of water stocked during season

*1930-31 .....	.....	.....	.....	.....
1931-32	37	30	7	4
1932-33	20	9	11	22
TOTALS	57	39	18	26

*Six months to March 31.

REVENUE OBTAINED FROM FISHING LICENSES, PERMITS,
SALES AND SUNDRIES

Fiscal Year	Revenue
*1930-31	\$ 4,849.29
1931-32	18,861.22
1932-33	14,739.60
TOTAL.....	\$38,450.11
Decrease this year in comparison with last.....	\$ 4,121.62

*Six months to March 31.

COAL PRODUCTION

The total output of coal produced in the Province during the calendar year, 1932, showed an increase of 305,740 tons over the output for 1931. Production during 1932 totalled 4,870,030 tons with a valuation of \$13,441,193.00. Included in this total were 2,046 tons produced by farmers under permits granted for their own use.

Disposition of Products.—Coal sold for consumption in this Province reached a total of 1,134,311 tons for the calendar year, 1932. The balance of production was disposed of as follows: Shipped to other provinces in Canada, 1,751,294 tons; shipped for consumption in the United States, 27,366 tons; sold to railway companies, 1,619,921 tons; used for making briquettes, 12,629 tons; used for making coke, 4,591 tons; used under colliery boilers, 179,597 tons; used by colliery railroads, 7,025 tons; put into stock, 44,115 tons; put to waste, 130,528 tons. Tonnage shown as sold for Alberta consumption includes the 2,046 tons produced by farmers for their own use already mentioned.

COAL PRODUCTION		
Calendar Year	Tonnage	Valuation
1930	5,755,911	\$19,379,000.00
1931	4,564,290	13,415,745.00
1932	4,870,030	13,441,193.00
TOTALS.....	15,190,231	\$46,235,938.00
Increases this year in comparison with last.....	305,740	\$ 25,448.00

A total of 643 persons was examined during the year for certificates of competency as coal-miners. Of this number, 557 were successful.

Samples Tested.—Testing with the Burrell and McLuckie gas detectors was carried out in the various mines throughout the Province during this period, and samples of mine air, taken from mines in the bituminous areas, were forwarded for analysis to the Chemistry Branch of the Department of Mines at Ottawa.

Samples, also, of rock dust for use in bituminous mines were sent to the Provincial Analyst to be tested for silica content, and samples of coal were collected and forwarded to the Research Council of Alberta for analysis.

Disposition of Electrical Power.—Electrical power purchased for the use of Alberta coal-mines during the year totalled 14,875,890 k.w.hrs., distribution of which from the various power companies in the Province was as follows:

	k.w.hrs.	
Big Valley	10,800	Purchased from the Union Power Co., Drumheller.
Drumheller area....	3,819,350	" " " " " "
Carbon area	106,990	" " " " " "
Edmonton area....	781,297	Purchased from the Calgary Power Co.
Gleichen area	900	" " " " " "
Lethbridge area....	597,146	" " " " " "
Taber area	9,535	" " " " " "
Camrose area	6,200	" " " " " "
Redcliff area.....	38,000	Purchased from the city of Medicine Hat.
Crowsnest area....	9,505,672	Purchased from the East Kootenay Power Co.
TOTAL.....	14,875,890	

There was no purchase of electrical power by the mining companies in the Coalspur and Cadomin areas, the mines in these districts manufacturing what power was necessary for their own operations.

ELECTRICAL POWER USED FOR OPERATION OF ALBERTA COAL-MINES

Calendar Year	k.w. hrs.
1930	25,003,606
1931	16,918,625
1932	14,875,890
TOTAL.....	56,798,121
Decrease this year in comparison with last	2,042,735

Employment Increase.—During the month of December, 1932, there were 10,296 persons employed in Alberta coal-mines, an increase of 391 over the corresponding month of last year.

Mines Branch Annual Report.—Statistical information covering Alberta coal-mining activities for the calendar year, 1932, is given in complete detail in the published annual report of the Mines Branch, which appears as a separate publication to this report.

SHALE AND CLAY MINED

During the calendar year, 1932, 8,446 tons of shale and clay were mined, from which 3,444,010 bricks and 182 tons of tile were manufactured. Three shale pits were in operation this year producing shale and clay for use in the manufacture of brick, hollow tile and similar products. Information covering this production is also included in the annual report of the Mines Branch, calendar year, 1932, already referred to.

SHALE MINED—BRICKS AND TILES MANUFACTURED

Calendar Year	Shale mined (tonnage)	Bricks manufac- tured (number)	Tiles manufac- tured (tonnage)
1930	67,517	22,007,045	.....
1931	23,855	7,091,080	2,825
1932	8,446	3,444,010	182
TOTAL.....	99,818	32,542,135	3,007
Decreases this year in comparison with last...	15,409	3,647,070	2,643

BIRD SANCTUARIES AND PUBLIC SHOOTING GROUNDS

The care of bird sanctuaries and public shooting grounds, upon the transfer of the natural resources to this Province, was placed with the Fisheries Division of this Department. Six large sanctuaries and five small ones in Alberta are under control, and by a general consensus of public opinion they constitute a very real benefit.

The protection of these areas for the specific purpose of creating resting places for great numbers of ducks, geese and other water fowl has been zealously carried out. Public shooting grounds are also established with a view to assuring sportsmen of permanent hunting places during the open seasons.

Individual detailed reports from the various divisions of the Department follow.

Your obedient servant,

J. HARVIE,
Deputy Minister.

October 23rd, 1933.

Provincial Lands Administration

REPORT OF THE EDMONTON LAND AGENT, J. W. STAFFORD

During the fiscal year to which this report appertains, no appreciable difference is apparent in the volume of business transacted at this office. In some branches there is a slight increase, while in others a small decrease appears. On the whole, however, the work performed comprises practically the same amount as in the previous fiscal year. Correspondence has been heavy and applicants calling personally at this office entailed a great deal of work.

The following is a statement of the business handled in this Agency in addition to the collection of ordinary revenue and the transaction of routine work:

Homestead entries granted	2,300
Soldier entries granted	23
Applications for grazing leases	27
Applications for school lands cultivation leases	114
Applications for provincial lands cultivation leases	2
Applications for petroleum and natural gas rights.....	26
Applications for coal-mining leases	16
Domestic coal permits issued	9
Bar-digging permits issued	6
Certificates of work issued (quartz)	2
Applications for quarrying	5
Placer mining claims granted	4
Quartz mining claims granted	22
Grazing permits issued, school lands	460
Grazing permits issued, provincial lands	75
Timber permits issued	1,257
Permits to operate a saw-mill issued	286
Hay permits issued	625
Number of applications for patent received	529
Number of applications for patent dealt with	969
Number of applications for patent checked for head office.....	1,755
Number of applications for cancellation received	1,206
Number of entries cancelled	1,633
Number of timber berths on provincial lands, sold	39
Number of timber berths on school lands, sold.....	4
Number of letters received	41,728
Number of letters dispatched	61,570
Number of stencils cut, 373, pages mimeographed	129,325
Number of translations for this and other Departments.....	230

Of the homestead entries granted, 2,043 were first homesteads and 257 second homesteads. Homestead entries granted to women accounted for a total of 569.

The following statement sets forth clearly the amount of revenue collected each month with classification thereof:

Month	Lands	Timber and Grazing	Mining Lands	School Lands	Tax Recovery	Total
1932—						
April	\$ 2,605.75	\$ 8,935.29	\$ 15,741.94	\$12,122.83	.....	\$ 39,405.81
May	3,037.25	9,991.78	4,939.86	5,181.46	\$13.00	23,163.35
June	4,208.32	5,965.67	6,196.15	8,736.21	1.50	25,107.85
July	3,818.26	17,150.50	16,534.15	2,403.06	3.00	39,908.97
August	3,012.78	8,810.82	1,504.93	2,544.70	22.08	15,895.31
September	2,406.55	9,952.89	11,116.78	2,397.27	16.00	25,889.49
October	4,520.96	13,677.90	17,690.63	4,498.27	.....	40,387.76
November	3,117.83	4,415.18	4,164.11	6,107.39	.....	17,804.51
December	2,022.82	3,759.41	8,471.65	3,466.92	.....	17,720.80
1933—						
January	2,117.89	6,241.42	17,909.04	1,200.45	.....	27,468.80
February	3,814.65	10,268.08	3,611.77	2,789.94	7.36	20,491.80
March	2,047.97	2,480.40	7,075.46	6,019.03	30.75	17,653.61
TOTALS	\$36,731.03	\$101,649.34	\$114,956.47	\$57,467.53	\$93.69	\$310,898.06

The mining division, with an increase of \$10,000.00, is the only one showing an increase in revenue. A decrease is apparent in all the other branches, the total amounting to approximately seven per cent.

These revenues comprise payments on account of land sales, royalties and rentals on coal, petroleum and natural gas leases, rental on grazing leases, fees covering quartz and placer claims, homestead entry fees, payments for the issue of grazing and cultivation permits on school lands and business of a similar nature.

In connection with the coal-mining industry the records indicate thirty-five mines in operation with a total gross production of 1,236,852 tons.

Logging and lumbering operations employed approximately the same number of men as during the last fiscal year, and the records indicate a substantial increase in the manufacture of lumber and railway ties.

The following statement shows the products manufactured by holders of timber berths under yearly licenses and permits:

	License Berths	Permit Berths	School Lands Berths
Feet, board measure, lumber manufactured.....	37,920,714	7,127,943	277,631
Railway ties	20,487	165,178	.....
Lineal feet piling .....	.....	560	.....
Lath	3,780,255	82,200	.....
Mine timber, feet	6,710	97,500	.....
Lineal feet logs .....	.....	2,312	.....

The total amount of lumber manufactured during this fiscal year is shown to be 46,946,953 feet board measure together with 257,998 railway ties; 1,167 miscellaneous permits were issued authorizing the cutting of timber on provincial lands and 90 permits authorizing the cutting of timber on school lands. The quantity of timber authorized to be cut under these permits together with the quantity shown as having been cut thereunder is as follows:

	PROVINCIAL LANDS		SCHOOL LANDS	
	Amount authorized	Amount cut	Amount authorized	Amount cut
Feet, board measure	7,135,671	1,613,280	142,000	7,385
Lineal feet	254,187	164,513	5,898	2,456
Fence rails	1,020,407	9,816	258	.....
Roof poles	228,659	3,847	.....	.....
Fence posts	254,247	25,592	1,400	1,300
Cordwood, cords	1,652	938	763	548
Railway ties	92,755	71,833	500	500
Telegraph and telephone poles.....	3,198	6,086	.....	.....
Lineal feet mining timber.....	307,314	85,895	3,060	.....
Lagging, cords	123	30	.....	.....

One hundred and seven seizures were made of timber cut from provincial lands and 16 of timber cut from school lands as follows:

	Provincial Lands	School Lands
Amount of timber covered thereby:		
Lineal feet logs	80,265	1,781
Feet board measure lumber	2,040,253	50,670
Mine timber, lineal feet	330	.....
Fence posts	5,140	.....
Telephone poles .....	.....	1,250
Ties	18,156	840
Lath	123,422	.....
Cordwood, cords	373	20

In connection with hay, 406 permits were issued on provincial lands authorizing the cutting of 3,276 tons and under authority of which 2,611 tons were cut. On school lands, 219 permits were issued authorizing a total cut of 1,330 tons in connection with which 1,103 tons were reported as having been cut.

Four seizures were made, covering a total of 63 2/3 tons.

REPORT OF THE CALGARY LAND AGENT, M. GOSSIP

The volume of business in the Calgary office during the fiscal year ending March 31st, 1933, showed no material diminution over the previous year, although the revenue collected was somewhat less.

The general routine work was very heavy and a great deal of correspondence was caused by enquiries regarding the anticipated opening up of land for homesteading together with an increased interest in petroleum and natural gas and matters pertaining to cultivation leases and permits on provincial and school lands.

Owing to the fact that homesteading was discontinued in this district during the previous year, practically no entries were accepted. The entries granted were based on proceedings originating prior to the discontinuation of homesteading.

No applications for cancellation were accepted from the public during the year, but as proceedings were instituted on behalf of the Department in cases where five years had elapsed since the date of entry, a number of such entries were cancelled. In addition, this action was instrumental in inducing settlers, who had held entry for five years or more, to make application for patent or to place themselves in a position to do so.

The following is a statement of the business handled in this Agency during the year, in addition to the collection of revenue and transaction of work of a routine nature:

Homestead entries granted	2
Applications for grazing leases received and checked	45
Applications for petroleum and natural gas leases	5
Applications for petroleum and natural gas permits	2
Cancellations of petroleum and natural gas leases and permits.....	4,005
Applications for coal leases	22
Domestic coal permits issued	19
Coal leases and permits cancelled	72
Quartz claims granted	5
Placer claims granted	1
Applications for cultivation leases received	158
Grazing permits issued on school lands	757
Grazing permits issued on provincial lands	182
Timber permits issued	154
Cancellations instituted	251
Entries cancelled	171
Applications for patent received	151

The total revenue received at the office during the year amounted to \$246,413.09, of which \$242,336.39 was applied as shown in the following statement:

Month	Lands	Timber and Grazing	Mining Lands	School Lands	Tax Recovery	Total
1932—						
April	\$ 105.50	\$ 1,702.86	\$ 29,331.59	\$ 3,531.22	\$ 65.78	\$ 34,736.95
May	138.61	1,948.04	13,421.39	1,385.48	43.21	16,936.73
June	179.35	846.75	10,257.94	515.37	123.20	11,922.61
July	317.31	2,703.22	12,628.91	988.36	7.00	16,644.80
August	76.35	1,614.42	11,318.86	517.02	.....	13,526.65
September	13.20	959.47	13,974.17	539.37	.....	15,486.21
October	85.35	2,394.11	27,435.74	1,429.11	.....	31,344.31
November	309.41	1,224.18	15,825.54	2,162.32	10.00	19,531.45
December	188.95	1,087.76	15,791.31	1,403.87	13.00	18,484.89
1933—						
January	87.60	764.80	23,935.57	2,704.10	.....	27,492.07
February	188.35	688.26	13,244.26	1,595.84	59.84	15,776.55
March	103.37	1,186.17	8,832.21	10,174.06	157.36	20,453.17
TOTALS.....	\$1,793.35	\$17,120.04	\$195,997.49	\$26,946.12	\$479.39	\$242,336.39

The above revenue was chiefly derived from collections on petroleum and natural gas royalties which amounted to approximately \$71,749, as compared with \$124,665 collected the pre-

vious year. Timber royalties also showed a decrease, but royalties on coal increased from \$56,884.94 to \$60,690.64.

It is estimated from returns received in the office that the approximate amount of naphtha and crude oil sales from wells operating on provincial lands in this district amounted to 454,367 barrels, while 1,215,038 tons of coal were produced from mines operating under authority of government leases and sales subject to royalty. Settlers mined 151 tons of coal for their own use, and it might be observed that interest in this class of permit is increasing very much from year to year.

There was no activity in placer or quartz mining. In the report covering the fiscal year ending March 31st, 1932, attention was drawn to the activity in the vicinity of the head waters of Fallen Timber Creek in township 29, range 9, west of the 5th meridian. Operations in this area have not led to any discovery, and practically all the claims recorded have now lapsed.

Timber operations were very much curtailed and were practically at a standstill. The following statements show the products manufactured by holders of timber berths under yearly licenses and permits:

	License Berths	Permit Berths
Board measure lumber manufactured	261,167	65,589
Board measure lumber sold	2,289,599	115,853
Railway ties	2,542	973
Mine timber, lineal feet	28,242	5,012
Saw logs cut	3,310	546
Lath	100,150	.....

TIMBER OPERATIONS CONDUCTED UNDER AUTHORITY OF PERMITS
ISSUED TO SETTLERS AND OF A MISCELLANEOUS NATURE

	Provincial Lands	School Lands
Permits issued	133	21
Feet board measure	298,711	20,000
Lineal feet building logs	30,993	400
Fence rails	15,987	200
Roof poles	4,654	33
Fence posts	5,200	160
Cordwood, cords	1,016	174
Railway ties	1,610	.....
Telegraph and telephone poles	680	.....
Mining timber, lineal feet	72,804	.....
Shingle bolts	10,000	.....

TIMBER SEIZURES

	Provincial Lands	School Lands
Number	8	1
Amount of timber covered thereby:		
Feet board measure	1,629,211	.....
Saw logs	2,434	.....
Fence rails	800	.....
Railway ties	628	.....
Mine ties	257	.....
Lineal feet mine timber	15,612	.....
Ties .....	.....	30

HAY PERMITS ISSUED

	Provincial Lands	School Lands
Number	58	45
Tons of hay cut	893	565

REPORT OF THE LETHBRIDGE LAND AGENT, R. CRUICKSHANK

The transactions of this office for the fiscal year ending March 31st, 1933, as shown by the following statement indicate a large volume of work, and although a decrease of revenue is shown in some branches, a considerable increase appears in others. The total revenue derived from the business of this Agency, including payments made direct to the Administration office, almost equals that received during the past fiscal year.

The following outlines the business transacted in addition to the collection of ordinary revenue and work of a routine nature:

Applications for grazing leases	156
Applications for cultivation leases	152
Applications for petroleum and natural gas leases	20
Applications for coal-mining leases	6
Applications for lime, stone, quarrying	1
Applications for placer mining	1
Domestic coal permits	98
Provincial lands grazing permits	250
School lands grazing permits	362
Provincial lands cultivation and grazing leases issued	65
School lands cultivation and grazing leases issued	19
School lands cultivation and grazing permits issued	2
Timber permits on provincial lands	8
Timber permits on school lands	4
Hay permits on provincial lands	14
Hay permits on school lands	7
Gravel permits issued	7
Portable saw-mill berths	1
License berths	1
Number of applications for patent received	59
Number of cancellations instituted	136
Number of entries cancelled	58

No homesteads, second homesteads or soldier entries were granted, this privilege having been discontinued in this Agency on September 5th, 1931. The entries against which cancellation proceedings were instituted cover pre-emptions and homesteads of over five years standing.

The total revenue received at this office during the year was \$103,417.30, which was applied under the following headings as shown by monthly distribution:

Month	Lands	Timber and Grazing	Mining Lands	School Lands	Tax Recovery	Total
1932—						
April	\$ 11.90	\$ 1,655.85	\$12,787.10	\$ 4,276.03	\$1,353.58	\$ 20,084.46
May	6.85	976.85	2,741.93	1,255.25	909.08	5,889.96
June	41.75	1,031.71	587.03	1,883.73	698.25	4,242.47
July	59.20	1,248.31	7,142.78	1,416.81	485.75	10,352.85
August	21.25	1,378.06	4,459.49	183.78	207.51	6,250.09
September	243.30	2,886.16	1,002.36	127.35	416.40	4,675.57
October	343.85	1,912.60	10,223.52	1,285.71	263.62	14,029.30
November	672.75	3,211.77	1,086.52	766.23	683.40	6,420.67
December	153.00	1,079.70	1,093.09	347.84	301.20	2,974.83
1933—						
January	275.55	980.28	8,995.91	400.79	205.42	10,857.75
February	165.25	1,110.19	4,687.05	2,060.63	751.99	8,775.11
March	316.48	1,086.23	1,068.93	4,278.67	2,123.93	8,864.24
TOTALS.....	\$2,310.93	\$18,557.71	\$55,865.71	\$18,282.82	\$8,400.13	\$103,417.30

Increases in revenue appear in the lands, school and tax recovery branches, but the branches of timber, grazing and mining show a decrease. The decrease in the timber and grazing branch is offset by the increase in the tax recovery branch. The mining division decrease is due to the greatly reduced activity in the filing of petroleum and natural gas applications.

Royalty was collected on the sale of 33,261.71 barrels of oil, this being a reduction of almost 25,000 barrels from the previous year.

TIMBER AND HAY PERMITS, TIMBER SEIZURES

	Provincial Lands	School Lands
Timber permits issued	8	4
Cords of wood	12	5
Fence posts	300	800

HAY PERMITS

	Provincial Lands	School Lands
Number of tons of hay, 114	14	....
Number of tons of hay, 33 .....	....	7

TIMBER SEIZURES

	Provincial Lands	School Lands
54 poles	1	....

REPORT OF THE PEACE RIVER LAND AGENT,
A. B. SPENCE

The business of this office for the period in question shows a decrease from the preceding year due to the continued depression, but this is partly made up by a marked decrease in expenditure.

The following statement gives a general idea of the business in force as at March 31st, 1933:

Petroleum and natural gas leases and berths covering approximately 26,709.60 acres	74
Quarrying leases	8
Domestic coal permit	1
Grazing leases covering 71,919.40 acres	195
Time sales and school lands sales	209
License berths	9
Portable saw-mill berths	10
Cordwood berth	1
Fire-killed berths	2
Custom saw-mill permits	19

This statement does not include the number of unpatented entries, applications for inspection, cultivation, grazing, hay and timber permits or other matters of a miscellaneous nature outstanding at this time.

During the period of this report the following business has been handled in addition to the collection of ordinary revenue and the transaction of routine work:

Homestead entries granted	653
Second homestead entries granted	53
Soldier entries granted	4
Applications for grazing leases	20
Grazing permits issued, school lands	63
Grazing permits issued, provincial lands	44
Cultivation leases (six years)	2
Timber permits issued	527
Applications for patent received	513
Patents recommended	336
Applications for cancellation received	475
Lands cancelled	806
Custom saw-mill permits	35
Timber berths in operation	26
Coal leases	2
Domestic coal permits	1

The following statement shows the different classes of revenue received during the year:

Month	Lands	Timber and Grazing	Mining Lands	School Lands	Tax Recovery	Total
1932—						
April	\$ 1,075.30	\$ 523.09	\$ 10.75	\$ 193.73	.....	\$ 1,802.87
May	895.65	879.31	.....	82.90	\$ 9.50	1,867.36
June	1,790.60	554.66	.....	11.65	.....	2,356.91
July	1,365.45	645.38	45.00	106.06	12.15	2,174.04
August	1,338.10	317.89	1.00	34.50	3.50	1,694.99
September	1,058.85	258.77	.....	2.25	.....	1,319.87
October	1,021.85	369.50	.....	24.20	.....	1,415.55
November	1,021.29	199.66	.70	1.00	.....	1,222.65
December	658.35	163.74	4.60	100.00	.....	926.69
1933—						
January	624.25	149.74	49.02	50.56	.....	873.57
February	514.25	194.32	4.10	425.40	7.40	1,145.48
March	637.35	422.00	4.60	334.07	11.88	1,409.90
TOTALS.....	\$12,001.29	\$4,678.07	\$119.77	\$1,366.32	\$44.43	\$18,209.88

The above revenue is made up entirely of cash received in this office in connection with rentals on grazing leases, rentals on petroleum and natural gas, homestead fees, payments on grazing permits, hay and timber permits and other business of a miscellaneous nature. Additional Peace River district revenue, not shown in this report, has been received by the Department in connection with timber berths, petroleum leases, school lands sales and grazing.

Collections have not improved since the previous year, thus necessitating a great deal of correspondence. There has been no petroleum development in the district during this period, and many leaseholders have allowed their leases to be cancelled.

	Provincial Lands	School Lands
Timber permits issued	517	10
Feet board measure	1,915,181	80,513
Lineal feet logs	268,000	9,200
Fence rails	250,343	800
Roof poles	88,850	1,970
Fence posts	110,665	2,120
Cordwood (cords)	3,447	75
Railroad ties	3,625	.....
Piling, lineal feet	20,355	752
Telephone poles	1,994	.....

TIMBER SEIZURES

	Provincial Lands	School Lands
Number	6	.....
Account of timber covered thereby:		
Feet board measure	10,000	.....
Fence posts	500	.....
Lineal feet piling	9,850	.....
Railway ties	5,357	.....

HAY PERMITS

	Provincial Lands	School Lands
Number	176	48
Tons of hay	1,545	424

HAY SEIZURES

	Provincial Lands	School Lands
Number	4	2
Tons of hay	36	37

REPORT OF THE GRANDE PRAIRIE LAND AGENT, J. J. E. CLARKE

The business transacted at this office during the period of this report shows a decrease in revenue amounting to \$3,484.77, which was doubtless caused by the acute world-wide financial situation. Owing to the shortage of money and scarcity of labour, many people, who otherwise would have done so, were unable to take up land. The collection of payments on land sales, rentals and improvements has also been very difficult.

The following gives a general idea of the business in force at this time:

Homestead entries granted	462
Soldier entries granted	2
Improvement payments	109
Applications for cancellation fees	199
Authorities to refile issued	165
Searches and maps	182
Applications for patent received	299
Cancellation proceedings instituted	217
Entries cancelled	315
Custom saw-mill permits issued	27
Grazing permits issued	35
Timber permits issued	586
Hay permits issued	129
Grazing rentals collected	81
Timber excess payments	116
Mining fees	5
Mining rentals	8
Mining royalty payments	21
Letters received	6,282
Letters dispatched	6,899
Land sale payments	20

In addition to the above may be added work of a miscellaneous nature such as timber seizures, hay excess and other sundry transactions.

The following is a statement showing the different classes of revenue received during the period covered by this report:

Month	Lands	Timber and Grazing	Mining Lands	School Lands	Fur Farm	Total
1932—						
April	\$ 826.65	\$ 994.77	\$ 94.65	\$ 36.15	\$25.00	\$ 1,977.22
May	882.10	549.10	45.00	1,081.45	.....	2,557.65
June	1,299.65	378.55	.....	82.87	.....	1,761.07
July	877.60	399.00	4.55	715.16	.....	1,996.31
August	910.75	152.60	.15	375.28	.....	1,438.78
September	647.95	129.37	45.00	67.30	.....	889.62
October	605.50	106.49	50.05	13.00	.....	775.04
November	520.75	224.92	87.45	56.95	.....	890.07
December	376.15	240.01	10.00	382.70	.....	1,008.86
1933—						
January	355.50	153.89	54.30	229.28	.....	792.97
February	164.25	289.26	34.25	72.19	.....	559.95
March	208.10	345.75	20.30	155.13	.....	729.28
TOTALS	\$7,674.95	\$3,963.71	\$445.70	\$3,267.46	\$25.00	\$15,376.82

To this should be added a number of payments on school lands sales made direct to the Department.

The revenue received is made up of homestead entry fees, payments for improvements, land sales, etc., as shown in the schedule of business.

Owing to the very small returns for grain and livestock, payments for both general lands sales and school lands sales were small.

There has been a slight decrease in the number of timber permits issued as compared with the previous year owing, doubtless, to the inability of settlers to pay for sawing. However, as payment can now be made by toll, the issuance of a large number of permits is anticipated.

The demand for local coal continues to increase and the returns received show 2,211 tons mined during the year. The returns for the period ending March 31st, 1933, have not all been received, and as the preceding three months were very cold there will probably be a large increase in these figures when the outstanding reports are obtained.

It will be noticed that there is practically a fifty per cent. increase over the previous fiscal year in the number of applications for patent received. There is only a slight difference in the number of entries cancelled, but there was a large decrease in the number of cancellation proceedings instituted, which is accounted for by the fact that the majority of settlers' wives and daughters filed cancellations during the previous year and in most cases secured the land.

The land office at Grande Prairie was closed as a measure of economy on March 31st, 1933, and the records were transferred to the Peace River office so that the business of both offices could be amalgamated. The staff was moved to Peace River with the exception of two, one being appointed as sub-agent at Grande Prairie and the other transferred to the Department in Edmonton.

	Provincial Lands	School Lands
Timber permits issued	581	5
Feet board measure	3,117,547	30,806
Lineal feet	242,693	600
Fence rails	727,983	.....
Roof poles	145,481	.....
Fence posts	171,450	.....
Cordwood (cords)	770	6

TIMBER SEIZURES

	Provincial Lands	School Lands
Number	6	.....
Amount of timber covered thereby:		
Feet board measure	374,747	.....
Lineal feet logs	700	.....

HAY PERMITS

	Provincial Lands	School Lands
Number	105	24
Number of tons of hay	764	144

Technical Division

REPORT OF THE TECHNICAL DIVISION, T. W. DALKIN

The past year has been notable to the Technical Division for the reason that a great many new duties, during the process of organization, have been added to its jurisdiction. A review, therefore, of these responsibilities, as at present organized, may be of interest.

Legal descriptions were drawn and areas calculated for all notifications (land patents) which covered homesteads, railway rights of way, church sites, school sites, community sites, nuisance grounds, accrued areas, surveyed roadways, private roadways and all other parcels of land granted by the Crown in the Province. A start has been made on the work involved in connection with the issuance of notifications covering the school lands required for right of way purposes by the Northern Alberta Railways Company, these rights of way being included in the sale of provincial-owned railways. Certain information, however, is still required from Ottawa regarding confirmation of valuations of these tracts. The plans have now been received and duly recorded. From time to time the rights of way of other railways were revised, and this necessitated the recording of new plans and the rectification of titles by the issue of new notifications.

All homestead entries were checked with respect to reservations for railway rights of way, roadways and any other patented or alienated portion of land. Where entries were made upon a quarter section affected by rivers, details of the fordableness of same were obtained in order to ascertain whether the entries might be allowed on both sides of the rivers or restricted to one. Final areas of such entries were computed and the land agencies notified accordingly.

Considerable correspondence has taken place between this Division and the Surveys Branch of the Department of Public Works in connection with the reservation of lands required for new surveyed roadways in open Crown lands. Where lands are under sale, the necessary compensation is exacted and notification issued accordingly. In this connection 166 plans affecting a large number of parcels of land have been recorded. Certain roadways have been abandoned and added to the homestead, sale or ranch, as the case may be. If telephone lines are erected on such abandoned roadways then the interests of the Alberta Government Telephones are protected accordingly.

Applications for leases regarding recreational grounds and exhibition sites are dealt with, and in some cases such leases have been issued. Certain Crown lands were discovered to be suitable for park sites, and accordingly applications have been received and provisional reservations made.

Applications are also dealt with in connection with licenses of occupation for power transmission lines and pipe line rights of way, boat-house sites, pier sites, bridge sites, beacon sites and aeroplane

landing bases. In some cases this necessitates the checking and recording of plans in the Division.

In checking over the fiats received from Ottawa it has been discovered that certain free grants of land made for religious purposes have been sold and used for purposes other than originally intended, with the result that certain compensations have been paid into the office and the release of the habendum clauses has been issued.

A great deal of work has been entailed in connection with tax recovery lands transferred to this Department by the Department of Municipal Affairs. The descriptions of lands are being checked and Orders in Council executed, and it is hoped to eventually set up a complete index system for the various titles. Plan records are now in the process of being made, copies of which will be forwarded to the respective land agencies.

All the duplicate certificates of title received from Ottawa covering lands in the name of the Dominion of Canada have been cancelled into the name of the Province, and complete records of such lands and certificates of title have been made.

Patents are still issued by the Dominion Government for Soldier Settlement Board lands in Alberta, but in every case a record is kept of such patents and particulars of these reservations from such lands are forwarded to Ottawa by the Division.

In connection with the transfer of the natural resources to the Province, certain lands were retained by the Dominion Government, and complete details of such areas have been delimited upon the plan records.

Some exchanges of lands in the Tilley East area have been effected in conjunction with recommendations from the Department of Municipal Affairs. Certain other lands have been sold and patented to various drainage and irrigation districts on the application and recommendation of the Chairman of the Drainage Council.

Sets of records are now being compiled on individual township plans from information received from Ottawa. These will show the standing of the lands as set forth hereunder:

TIMBER AND FORESTRY: License and permit berths and sales, surface rights and railway leases.

GRAZING: Leases, stock watering reserves, hay permits, special reserves.

MINING: Petroleum and natural gas leases, petroleum and natural gas crown reserves, petroleum and natural gas prospecting permits, tar sand leases, tar sand permits, coal-mining leases, coal surface leases, quarrying leases, quartz and placer leases, patented under-rights.

Index records of the following are still being prepared: railways, transmission lines, roadways, pipe lines, Indian reserves, settlements, townsites, fiats including townsite fiats, temporary and miscellaneous plans.

Special statistical and data maps have been prepared showing various information including forestry reserve boundaries, fire ranging districts, crop share districts, soil surveys, bird sanctuaries, shooting grounds, coal outcrops, park boundaries, school lands sales, ranches, timber areas, location of coal-mines, location of oil and gas wells, location of operating, closed coal-mines and coal leases.

Plans, sketches and tracings have been made for record purposes and for departmental uses relative to timber leases, forestry reserves, grazing leases, accrued land areas, fractional land areas, patented land areas, coal leases, petroleum lease holdings, mine workings, river traverses, soil surveys, fur farming leases, details of complicated areas of lands, roadways and railways.

In addition to the foregoing, the current duties deal with applications for timber, forestry rights, mining, surface rights, etc. In this connection all such applications are checked for reservations and encroachments, areas computed, sketches prepared and legal descriptions drafted for incorporation in the leases which are also plotted on the township plans in their respective records. Partial assignments and amendments of such leases are dealt with in a similar way, also the plan records are adjusted in connection with cancellations.

Surveys required by the Department are executed by the Surveys Branch of the Department of Public Works, but these have been almost negligible in the past year. Reference, however, should be made to the squatter situation in Drumheller, where a survey was made and the location of all buildings obtained. Whilst an actual surveyed subdivision was not made upon the ground, a plan has now been prepared designating by lot and block the various buildings.

This Division undertakes the general drafting of all maps, plans and sketches for the Administration Office, Forestry Division, Mines Branch, Petroleum and Natural Gas Division, Fisheries Division, the Land Agencies and the general public, also the necessary mathematical and planimetric computations of areas in connection with the same.

Statistical information has been prepared covering the area of patented lands in the Province, area of lands under grazing, amount of stock grazed on certain lands, areas of timber lands, water area in the Province, area of school lands, area of surveyed lands in the Province and areas of national parks, forest reserves and Indian reservations.

Through co-operation with the Department of the Interior, Ottawa, the Division is now in possession of a very comprehensive stock of plans to which reference is constantly made, not only by various departments of the Government, but also by the general public.

Quite a large volume of correspondence is still carried on with the Chairman of the Dominion Lands Board in connection with various subjects, and it is felt that this report would be incomplete without an expression of appreciation in return for the prompt and satisfactory attention which has been given in this particular to all inquiries emanating from this Division.

Herewith appended are the number of notifications issued and details of acreages patented for the fiscal year ended March 31st, 1933.

ACREAGES PATENTED BY THE DEPARTMENT OF LANDS AND MINES
FOR THE FISCAL YEAR, APRIL 1st, 1932, TO MARCH 31st, 1933

	Notifications	Area, acres
Homesteads	1,012	159,513.38
Sales	69	1,886.10
Second homesteads	2	319.00
Soldier entries	61	10,191.39
Purchased homesteads	2	316.90
Pre-emption sales	7	1,120.00
Special grants	18	162.313
Exchange of lands, Tilley East area	7	1,108.05
School lands sales	54	4,051.36
Railway grants:		
Canadian Pacific Railway	2	0.13
Northern Alberta Railways Company	10	73.91
Canadian National Railways	16	144.70
TOTAL.....	1,260	178,887.233

Grazing

REPORT OF THE SUPERVISOR OF GRAZING, A. HELMER

The following is a report of the operations in this office since its inception in June, 1931.

It should be borne in mind that during the time the question of the transfer of the natural resources from the Department of the Interior was pending, the Dominion land agents continued to receive applications to lease lands in the Province of Alberta. Instructions were issued to the Dominion inspectors to report thereon, but no further action was taken by the Dominion Government. These partly dealt with applications which had originated with the Dominion and were taken over by the Provincial Government. Many of them had been reported on by the Dominion inspectors but, as before mentioned, the Department of the Interior had taken no further action thereon. When they came to the Province, therefore, these reports made by Dominion officials, no longer in the service, could not be approved by this office until the applications which were long outstanding and concerning which conditions had greatly changed, had been investigated and more recent information obtained than that given in the original reports.

During the past few years, many lands having been revested particularly in the dry portions of the Province, a number of settlers who had remained in the dry district began to make applications to lease lands which had become available and to build up around their location a grazing unit. This procedure accounts for the very large number of applications to lease, which, in the past few years, have come to the Department of Lands and Mines for adjustment.

So great in number have been these applications, and so vast a country which they covered, that delay in dealing with them was unavoidable. Investigations covering revested lands offer as a rule more difficulties than those in connection with Crown lands. The complications are greater and the grazing problems of the applicant sufficiently important to demand time being taken to carefully study them so that as far as possible an economic working unit may be arranged in order that the applicant can carry on with some reasonable certainty of success. To arrive at these units it is, in most cases, necessary to study not only the lands applied for, but to search records to learn what lands, if any, may have been available either at the time application was made or since. In short, for reasons given above, the handling of these applications requires time and care if the Department is to be helpful.

As a result of the drought conditions which have been prevailing for some seasons, the growth of the grass has been poor in the "short grass districts." With the water supply lessening, this has brought about over-grazing of the pasture, particularly near the water supply. Over-grazing is a serious matter, and if long continued will undoubtedly result in permanent injury to the range.

The palatable and nutritious grasses are the ones most closely cropped and those most easily destroyed. It is these grasses which give the greatest value to the range. The recorded history of the range is that these grasses, once destroyed, are replaced mostly by worthless weeds.

Grazing control to prevent overstocking is the solution, and for this practice a well distributed water supply is necessary. Its development is worthy of encouragement, and with a suitable supply arranged for grazing may be enforced. The grazing resources of the Province are not exhausted or bankrupt. They were large areas in the first place, and not even badly managed grazing or settlement of lands unfit for farming have exterminated them. They are, however, in danger.

Grass is the most important of all crops when the future welfare of the Province is considered. Today, cattle, if they are to find a market, must be grain finished. They must be of a type to meet the market requirements. That type in any sufficient number can only be bred and raised on the low priced grazing lands of the expert range rancher. Much depends on his skill in breeding and furnishing the type which can be finished on the farms made up of more expensive lands and small pastures where there is an abundance of grain and other fodder. It is only from such a source that the feeder can obtain the class of cattle which he can hope to finish with a profit. The producer is an expert. The feeder completes the picture. Therefore they are necessary to each other.

The stockman is subject to ever-changing conditions, climatic, financial, and market requirements. To succeed he must be ever on the alert. His investments are large and his hazards great, his losses at times staggering and his profits on the average small. He uses lands of low value, useless for any other purpose than grazing. He requires large areas of these lands, and as the carrying capacity per head per acre is low and varies with the seasons, his rental should be low. The revenue from these lands should not be the chief consideration, yet the national wealth he produces is so great that this should be given more consideration than revenue.

Many of the revested areas now being leased have in part been broken and cultivated. This has lessened greatly the organic matter and the native grass cover, because of this cultivation, has been completely destroyed. It will require many years of favourable seasons before these formerly cultivated areas are again grass covered. When they are it will probably be with a much inferior vegetation. The present grazing value of these lands therefore is small.

In order to facilitate the adjustment of various matters in connection with the ranching industry it has been necessary to spend considerable time in conference with officials of the Department of Lands and Mines at Edmonton. In addition it has also been necessary to meet ranchers at various points in order to discuss outstanding problems with them. It might further be stated that an endeavour to arrange the work has been made so as to give every assistance possible to ranchers who when visiting Calgary call both at this office and at the office of the local land agent. This

naturally necessitates giving a very large amount of time in discussing their problems and conflicts somewhat with the routine work of the office, but is nevertheless absolutely necessary. Incidentally, it is appreciated by the different persons involved and assists them towards a realization of the efforts the Department is making to secure a true grasp of their difficulties and the steps which are being taken to solve them.

Below is the number of applications received, the number of applications reported on and the miles travelled to make investigations and reports. These figures are for the two fiscal years ended March 31st, 1932, and March 31st, 1933, respectively. Many reports and correspondence in connection therewith have been prepared, although not covered by any application number. Application numbers are therefore not a complete guide to the activities of this office.

REPORTS AND APPLICATIONS FOR THE FISCAL YEAR ENDED
MARCH 31st, 1932

Applications received	678
Applications reported on	253
Renewal applications received	63
Renewal applications reported on	5
Special reports	5
TOTAL.....	1,004

MILEAGE FOR THE FISCAL YEAR ENDED MARCH 31st, 1932

Automobile	5,541 miles
Train	5,796 miles

REPORTS AND APPLICATIONS FOR THE FISCAL YEAR ENDED
March 31st, 1933

Applications received	171
Applications reported on	176
Renewal applications received	40
Renewal applications reported on	49
Applications received for additional lands	48
Applications received for additional lands reported on	12
Special reports	21
TOTAL.....	517

MILEAGE FOR THE FISCAL YEAR ENDED MARCH 31st, 1933

Automobile	12,537 miles
Train	5,448 miles

Petroleum and Natural Gas

REPORT OF THE DIRECTOR OF PETROLEUM AND NATURAL GAS, W. CALDER

The period covered by this report marks the third year of the world depression and, similar to other parts of the world, Alberta has passed through a further trying time in 1932. Many responsible and competent authorities have stated that conditions generally were improving, but the futility of these attempts to predict conditions ahead has become more and more apparent as the years of stagnation have continued.

Development in the oil and gas industry in this Province has consequently been marking time, but latterly there has appeared an increased interest in new work projected and undoubtedly, once it is fully appreciated that the imports of crude oil to Alberta alone approximate one million barrels yearly, also that crude oil can be developed in remunerative quantities in certain parts of the Province without the necessity of risking extraordinary capital expenditure in individual wells, there is every reason to anticipate that there will be considerable oil development here in the future.

Several causes can be cited as retarding development, but the principal reason would appear to be that the investing public, having suffered considerable losses during the speculation period of 1928 to 1930, is withholding its finances. Coupled with the depression and lack of public interest a certain insecurity may also have been created in the minds of investors by the erroneous statements widely circulated to controvert the peaceful endeavours of the Government in directing well operators in the Turner Valley to introduce efficient production engineering methods so as to minimize the enormous waste of gas from that area.

During April, 1932, the Turner Valley Gas Conservation Board was created to continue and complete the tests previously carried out by the staff of this Division. The Board was fortunate in having a staff of six engineers solely and continuously employed on the tests. The results of their findings, which fully confirmed the initial data collected by this Division, were embodied in a very complete report as shown in Exhibit A, and contained an entire survey of past operations in the Turner Valley and recommendations for future efficient development.

The report was submitted to the operators at a public meeting held in Calgary, and was finally given very careful consideration by the Agricultural Committee of the Provincial Legislature. At both meetings the operators, particularly the independents, made strong protests against the pro rating recommendations of the Board being confirmed by legislation. The Agricultural Committee, after hearing the views of the operators, concluded that the full recommendations of the Board would not attain the desired voluntary pool operation of the field for which the Government had been striving. They decided that as the findings were available

for public perusal, no useful purpose would be gained by continuing the tests at the public expense, and that the future operation of the field would be in accordance with the provincial regulations, subject to the cancellation of the temporary measure prohibiting the commencing of new wells with the limestone as the objective; also that the allowed volume of gas to be drawn from each well be increased to 40% in lieu of the 25% allowance in the regulations and finally the enforcement of the regulations in respect to the installation of meters. Copies of the Orders-in-Council confirming these are attached in Exhibit B.

The suspension of drilling permits for deep wells, when introduced, was considered necessary as a temporary restriction until such time as the work of the Turner Valley Gas Conservation Board was published in report form. Upon the report being available for the public the necessity for the restriction no longer applied.

Previous enforcement of the regulations with regard to metering was purposely held in abeyance pending completion of the Board's tests and, therefore, did not require any new legislation. With reference to the cancelling of Section 36, Paragraph A, of the regulations, this also was a temporary measure to facilitate and validate the test work required to be done by the Board.

Considerable expense has been incurred by the Government to obtain all the data possible relating to Turner Valley conditions. The expense, however, was unavoidable, as the information obtained could not have been collected in any other manner. It is satisfactory to note that justification for these efforts is now apparent by a slight improvement in operation. This would indicate that operators have realized that they would be the principal sufferers by a continuance of the wasteful methods that had dissipated a considerable volume of gas and many hundreds of pounds in useful pressure which, if retained in the ground, would have insured a more complete exhaustion of the naphtha from the underground formation than can now be expected. It is to be hoped that these endeavours towards efficiency will be continued with greater vigour as there is still a very useful underground pressure which, if economically used, will insure a natural propellant for forcing to the surface the naphtha which, it is very apparent, will not be possible of production by any of the known mechanical means except at exorbitant and prohibitive expense.

The occasion is opportune to consider the reason for efficient development as applied to the commercialization of natural resources. All over the North American continent a regrettable destruction of these resources was practised for many years. In many instances this destruction was selfish and unscrupulous. During the pioneer stage of development of all countries a certain and extravagant waste could not be avoided, owing to the inexperience of pioneers and lack of any form of control. But, when such waste was continued and no effort made to introduce efficient development, the continuance was criminal. In the working and development of natural resources a certain wastage is unavoidable even where the most efficient engineering methods are practised. Similarly, in most manufacturing processes a certain loss is consequent to processing, but the experienced manufacturer has always been striving to reduce such losses, with the result that in most up-to-

date works the absence of efficient and economic methods can now be classed as negligible.

Early in the century, the enormous wastage which had occurred and which was still occurring in the exploitation of forests both in the U.S.A. and Canada, created considerable discussion, principally owing to the possibility of climatic changes. The agitation created in the U.S.A. led to the United States Federal Government appointing an investigating body to report on all phases of destructive methods occurring in the development of the country. This body eventually became the Federal Conservation Board, and prepared statistics and data upon such methods generally. Amongst others the oil and gas industry was given a great deal of consideration owing to the magnitude of operations, and eventually a special subdivision was created known as the Federal Oil Conservation Board. In the opinion of the writer the title of the original Board and its subsidiaries was and is still misleading, as their appointment was not made with a view to the *halting of development*, but to obtain data on waste and make recommendations for efficient development. A more appropriate title, therefore, would have been that of "Economic Development Board."

Efficient development of oil and gas in other countries outside the American continent has been practised for many years, and waste whether by direct destruction or by permitting water inundation underground was minimized by vigorous Government control. In the oil and gas fields of the American continent strict Government control has never been possible, owing to the diverse ownership of the land and conflicting legal decisions, together with lack of unified legislation. This resulted in an orgy of waste which was introduced into these industries in the early years and has continued and been intensified with time. An ever-increasing greed was also noticeable, an adverse influence which the operation of a natural resource unfortunately appears to develop in the minds of operators and their employees.

Owing to the lack of experienced local labour, operators, developing oil and gas in Alberta, were forced to obtain the necessary personnel for their work from adjoining producing areas in the United States, and as the imported men had been trained under the above mentioned vicious methods of development, similar wasteful practices, when production was obtained in the Turner Valley, were introduced. These, unfortunately, at the time of introduction could not be controlled owing to the inadequacy of the regulations to cover work done on alienated lands. The waste then introduced solely to obtain the naphtha represented a loss of from 150 to 175 thousand cubic feet of gas for each barrel of naphtha recovered. With the gas wasted there was a further loss estimated as ranging from .05 to .25 gallons of naphtha per thousand cubic feet, this loss being due to the poor separation in the well separators, which apparently were inadequate in capacity for the vast quantities of gas taken from the wells.

On obtaining possession of the natural resources in October, 1930, the Provincial Government immediately endeavoured to have tests made which would lead to the introduction of efficient production methods. In introducing these efforts the term "conservation" inadvertently crept into the discussions and at once created in the

minds of the operators and other interested persons, a suspicion that the desire was to curtail development. How unjustified this was must be fully appreciated by all disinterested persons when it is realized that the first endeavour of any governing body would be to foster the development of new industries which would lead to the eventual betterment of the people. To all who have consistently followed the peaceful efforts of the Provincial Government during the past two years to get the Turner Valley operators to combine in a working arrangement, it must be evident that these efforts had only one objective. An objective which would provide efficient and economical development by minimizing wastage and which would retain in the ground sufficient gas to insure that the greatest recovery of naphtha would be obtained without the introduction of expensive and possibly ineffective pumping equipment.

As anticipated in last year's report, there has been a marked decline in the total oil production, particularly in the naphtha, totals for comparison purposes being as follows (Exhibit C):

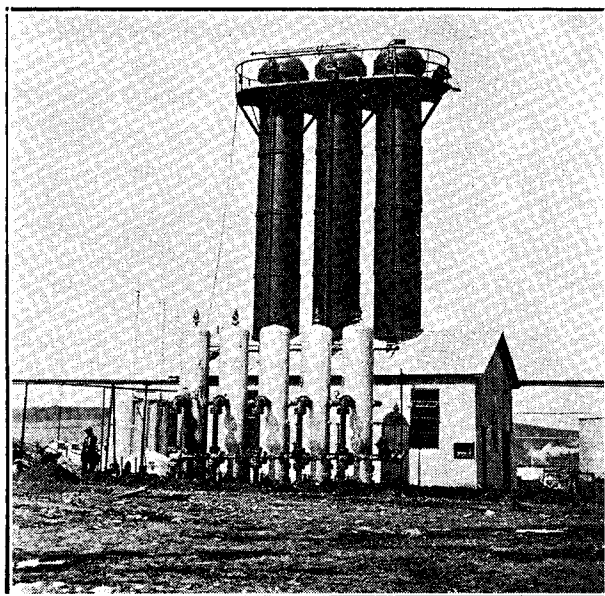
	1931-1932 Barrels	1932-1933 Barrels
Naphtha	1,143,875	810,958
Light Crude	86,000	52,238
Heavy Crude	16,453	7,886
TOTALS.....	1,246,328	871,082

Part of the decline in naphtha must be attributed to the restrictions of gas flow necessary during the period of the Turner Valley Gas Conservation Board tests which only terminated towards the end of the calendar year. The major portion of the decline, however, must be classed as due to the increasing dryness of the gas obtained from the older operated wells, and fully confirms the necessity for operators being compelled to discover methods of production which will reduce the waste and thereby prolong the naphtha producing life of these at present uneconomically operated wells.

The decline in light crude oil production has also taken place in the Turner Valley, and would appear to be due to no effort having been made in the previous year to commence wells for crude oil. Latterly there has been a renewal of interest in the potentialities of the crude oil horizons, and it is anticipated that as the cost of wells for such production is not excessive, a considerable number of shallow and inexpensive wells will soon be drilled. A further increase in crude oil is expected from deep limestone wells that will be plugged back when their owners fully appreciate the losses they are suffering by operating wells with high and wasteful gas/oil ratios. As an example that such plugging back will be profitable, there can be cited one deep well where the naphtha production was 1 1/3 barrels, representing a gross revenue of \$4.00 per day—an amount insufficient to pay the wages of attendants. This well was cemented off in accordance with the regulations and is now producing from the upper horizons a daily production of crude oil averaging 45 barrels and representing a gross monetary value of \$135.00 per day.

With regard to the reduction in heavy crude oil, this loss is partly due to the complete abandonment of the producing wells at Ribstone, the late operators contending that the wells could not be

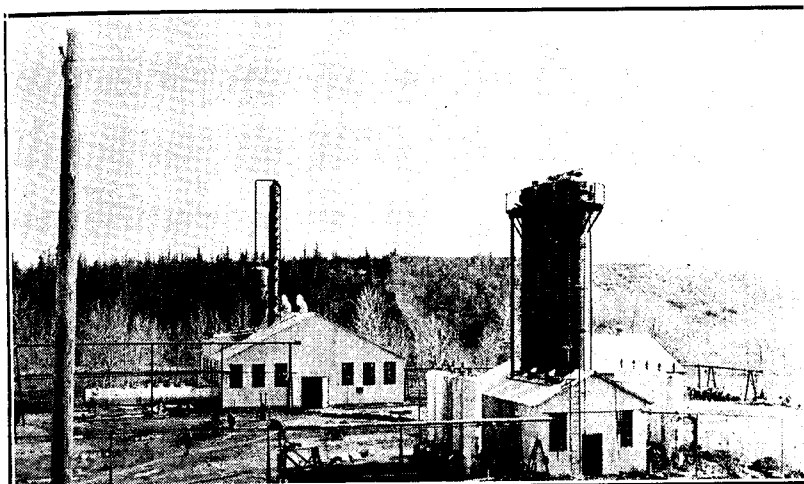
operated profitably. The abandonment of these wells is to be regretted, as there was ample evidence to prove that even if the average production per well did not exceed 25 barrels, this, after the payment of wages and Government royalty, would have represented an annual revenue approximating \$5,000.00 per well. Having been abandoned, this area may lie dormant for several years, but it is certain development will be renewed when the foregoing revenue return is appreciated. At Wainwright all classes of field work have been at a standstill, and the production has been negative, although there are completed wells with a gross available production estimated at 120 barrels. Here again it must be stated that although the settled production per individual well may be small—ranging from 12 to 20 barrels—these wells can be operated to give handsome returns. Unfortunately, each well is separately owned, and until some form of single management is introduced, it is certain economical development cannot be obtained.



TURNER VALLEY

Stripping separators and absorption towers.

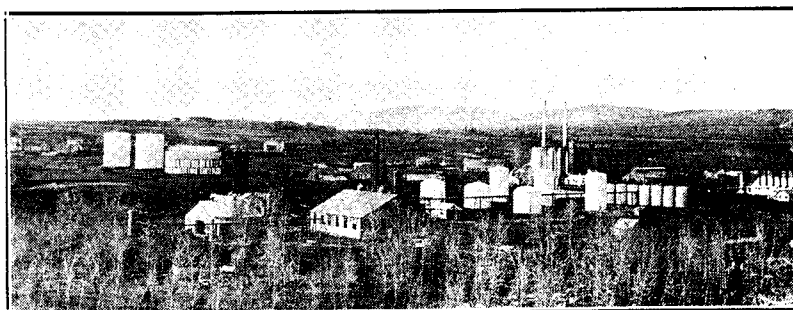
During the winter months the Royalite Oil Company has been erecting a new plant to process the waste gas and recover the naphtha content hitherto unrecoverable in the well separators. The new plant has a daily throughput of 75 million cubic feet and, based on a recovery equal to the average of the quantities lost, or .15 gallons per thousand cubic feet, results of this new processing should amount to 321 barrels per day, or 117,165 barrels per annum.



TURNER VALLEY

Absorption towers and fractionating unit.

The erection of this plant must be classed as a serious endeavour to combat waste, and it is to be hoped that its performance, when in operation, will be such as to encourage similar endeavours in other phases of field operations which will lead to that efficient development of the Turner Valley so much desired by the Government.



TURNER VALLEY

Absorption towers, fractionating unit and gas scrubbing towers.

One of the principal factors which govern the production of crude oil is that of drilling, and if this is not maintained any reduction is quickly reflected in production. Conforming to this, it will be noted in Exhibits C and D that the total footage drilled in the Province was again insignificant. There is a slight increase, however, as compared with 1931-1932, and this must be taken as an indication or forecast of a revival of interest in general prospecting.

Since the completion of the Turner Valley Gas Conservation Board tests considerable new drilling has been projected, all of the new locations being at the south end of the Turner Valley and the

adjoining area further south. Already four new wells are being drilled.

The only new oil discovery of importance was made near Athabasca, where heavy crude was encountered at a comparatively shallow depth. The thickness of the oil sand being very great, the discovery, if the sands are found persistent over a large area, may be classed as one of major interest, and undoubtedly will lead to considerable development work in the Athabasca district. Development of the find, however, is postponed as the operating company decided to drill deeper to explore the prospects of other potential horizons. A similar discovery was made by the same operators in their first well drilled near Smith, where, owing to faulty engineering, the sands became water-logged and the location was abandoned. This first test, however, being remote from rail communications, would have necessitated a great deal of capital expenditure before any product could be marketed. It is questionable if the abandoned area will be further prospected for many years.

In the development of gas, the only work of note was the completion of two wells at Kinsella. These have confirmed, over a large area, similar gas in considerable volume and pressure, to that found in the discovery well drilled by the Duluth Syndicate.

Consumption of natural gas from the various producing gas fields totalled 16,061,383,000 cubic feet.

The inspections by the staff of the Division during the year, in supervising the oil and gas wells within the Province, were 1,724. Of these inspections, 83 were made for special reasons whilst the remaining 1,641 may be classed under the heading of routine. To carry out these inspections journeys by rail and motor-car had to be made extending from Smith or Mirror Landing on the Athabasca River to Waterton Park in the south-west of the Province and to many points extending from the foothills east to the Fourth Meridian.

To maintain accurate records of the strata, water, oil and gas indications encountered during the drilling of wells, the following examinations and analyses were made:

Microscopic examinations of strata samples	3,998
Water analyses	58
Oil analyses	7
Gas analyses	2
TOTAL	4,065

On account of staff curtailment the examination of strata samples has had to be considerably reduced, and the practice now is to make complete examinations of the strata from wells in new areas only. Strata from wells drilled in known territory are only checked at remote intervals during the drilling of formations known to be barren of oil and gas. Close examinations, however, are made after potential productive formations are penetrated so as to discover the exact depths of known marker zones or geological divisions. The necessity of continuous water analysis cannot be over-emphasized, as it is solely by this means that dangerous underground water horizons can be recognized for control and complete isolation so as to prevent inundation of productive oil and gas horizons at lower depths.

EXHIBIT A.
REPORT OF THE TURNER VALLEY GAS
CONSERVATION BOARD.

INTRODUCTION

Prior to the passing of The Turner Valley Gas Conservation Act, efforts had been made by the Government to bring about some form of unit operation in the Turner Valley field with the object of curtailing the wastage of natural gas, and the services of Mr. F. P. Fisher, an engineer of high standing, had been retained for that purpose. A Technical Sub-Committee of the Oil and Gas Advisory Committee, consisting of three members, and of which Mr. Fisher was chairman, evolved a plan of voluntary pooling of the properties in the field, and it was then hoped that it would be possible to persuade the various interests concerned to adopt that plan and thus eliminate not only the further wastage of gas, but also a large part of the operating costs of the various producing companies. It was found, however, that the parties interested could not be brought into any agreement, and after a final and fruitless conference of the operators held in Calgary during the last days of the session of the Legislature, The Turner Valley Gas Conservation Act was passed.

The Turner Valley Gas Conservation Act provided for the appointment by the Lieutenant Governor in Council of a Board consisting of not more than three persons, the general object of such Board being the effecting of conservation of gas in the area set out in the Act and for the further purpose of endeavouring to bring about the unified operation of the wells in the field by means of pooling or otherwise.

Forthwith after the appointment, the Board was required to proceed to reduce the gas production in the field to not more than 200 million cubic feet daily. Thereafter, the Board was required to proceed with a series of tests of the wells in the field, the nature of these tests to be determined by the Board, for the purpose of determining the capacity of each well both in regard to gas and naphtha production, the measured value of each well and of any gas or oil rights in any area, and the total gas reserves. The Board was also required to determine the amount of gas necessary to meet the market demands and other requirements and to also determine efficient methods of effecting gas conservation.

Organization and Activities of the Board.

In pursuance of the above Act and by Order in Council No. 362/32 and dated April 23rd, 1932, a Board was constituted, the persons appointed thereto being Dr. R. C. Wallace, President of the University of Alberta; A. A. Carpenter, Chairman of the Board of Public Utility Commissioners, and John McLeish, Director of Mines, Ottawa.

A meeting of the Board was held on April 28th for the purposes of organization, at which meeting A. A. Carpenter was appointed chairman. Offices were secured in the old Telephone Building in Calgary, and the setting up of the necessary staff for carrying out the work set out in the Act was proceeded with. Appointments to the staff were made as follows: Field Staff: C. W. Dingman, G. R.

Elliott, J. O. G. Sanderson, R. V. Johnson, F. W. Shelton. Office Staff: D. S. Pasternack, statistician; Miss P. Darby, stenographer. Arrangements were made with the firm of Harvey and Morrison, chartered accountants, for the services to the Board of Mr. J. S. Simpson for the purposes of accounting.

The services of Mr. F. P. Fisher, the engineer employed by the Government in the endeavour to work out a voluntary pooling of the field, were retained by the Board for a period, for the purpose of organizing the tests to be carried out in the field. On the completion of their organization, Mr. C. W. Dingman was placed in charge of the field staff. The members of the Board, however, were of the opinion that it was advisable, when these tests were got under way, to call in the services of an engineer of wide experience in gas production, operating and pooling problems, who had not had any previous connection with the field, for the purposes of consultation and advice. Accordingly, the Board, about the time of the inauguration of the tests, secured the services of Mr. Frank McC. Brewster, of Bradford, Pennsylvania, who came to the Board with strong recommendations from both the Department of Mines at Ottawa and from the head of the United States Bureau of Mines.

The question of the nature of the tests to be carried out on the various wells in the field had been discussed at the conference held by Dr. Wallace with the operators in Calgary, prior to the enactment of the conservation legislation, and at a meeting of engineers representing the various companies a formula of tests was there evolved. This formula, though it eventually appeared that it did not represent a unanimous agreement amongst the interested parties, might, in the Board's opinion, be expected to yield the data, material for the determination of the various matters to be dealt with. Prior to the adoption of this formula, the Board notified the various operators in regard thereto and asked for their suggestions.

These tests involved the metering of all wells for a certain period, the taking of their closed pressures for a seventy-two hour period, the taking of a ten-day naphtha test with the wells operating at two-thirds of the regional closed in pressure and a gas flow test taken at a pressure of 500 lbs.

There are approximately some ninety producing wells in the field, none of which were, or at the present time are, metered. It was considered impossible to cover with a meter test the whole field at once, but the Board purchased twelve meters and secured thirteen meters on a rental basis, thus putting at its disposal twenty-five meters.

Owing to this limited number of meters, it was found necessary to divide the field for test purposes into four areas, it being the intention that the tests should be made in these areas successively.

Provision was made in the Act that during the time the field tests were being carried on, two or more wells belonging to the same person or two or more wells belonging to different owners, if these owners should agree, might be operated as a unit, if the written consent of the Board were obtained. However, in order to obtain comparative data in the field tests, it was found advisable to maintain the flow continuously from the individual wells, as a

pooling of production of several wells through the operation of a less number thereof, would have the direct effect of disturbing the balance of underground pressures and thus invalidate the data from the comparative point of view. This objection was raised at the outset by a number of operators, and it was decided that operators should maintain their production from the wells which were operating at the beginning of the tests, until these tests were completed.

On May 4th last the Board, in pursuance of the provisions of Section 13 of the Act, issued its Order No. 1, limiting the daily gas production in the field to 200 million cubic feet and restricting each producing well to its prorated allowance, based upon this total production, the order being effective on the 9th day of that month.

Action was immediately taken by Spooner Oils, Limited, to contest the Board's jurisdiction, and similar action was also taken by the Richfield Oil Company, Limited. The latter action was not continued, but the former company was successful in obtaining an interim injunction which, for the time being, effectively prevented the enforcement of not only the conservation measures, but the commencement of the field tests. This injunction was not finally dissolved until June 24th last, when judgment was given in the action in favour of the Board.

An appeal against this judgment was made to the Appellate Division of the Supreme Court, and came on for hearing in October last. The Appeal Court held that the main provisions of the Act were *intra vires*, but that the provisions relating to the levying upon the operators for the expenses of the Board in carrying on its operations, were *ultra vires*. No levies, however, had been made under these provisions, so that no complications resulted from this finding.

The result of these injunction proceedings was that the tests in the first area could not be proceeded with until the early part of July last, and the completion of the tests in the last area was delayed until November 13th. At the close of the tests referred to, a twenty-four hour closed in pressure test over the whole field was taken, but owing to weather conditions, was not completed until the last week in November.

Literal compliance with the terms of the Act in so far as the completion of the public inquiry, and in so far as the submission of the Board's report is concerned has, as a consequence, been impossible. Apart from this, the field tests have taken considerably more time than originally estimated, while the time required for the assembling of the data obtained in these tests, was apparently not considered when drafting the Act.

The first order was based upon the information available in the office of the Petroleum and Natural Gas Division of the Department of Lands and Mines. As none of the wells in the field were metered, an effort was made in this order to translate the gas allowances into naphtha production so as to afford a ready method of measurement.

The only record of closed in pressures available at that time was that obtained by the Department of Lands and Mines in August, 1931, as a result of a twenty-four hour closed pressure test.

In order to correct as soon as possible any inequalities occurring in its first order, the Board took another twenty-four hour closed pressure test in the early part of last July. A new order, based upon information obtained in this test, was issued on August 4th last, and in this order it was found advisable to abandon the method of measurement by means of naphtha production and adopt a simple gas quota. From time to time this order was varied as a result of the data that became available from the tests in the various areas. It was also necessary as each area came under test to adjust the quotas allowed for the various wells outside the particular test area, and orders were issued from time to time for this purpose. At the close of the tests, the Board issued a new order, numbered 20, based on the data secured in these tests, this order being still in effect.

With the wells unmetered, it has been found extremely difficult to ensure absolute observance of the Board's orders for restriction. During the test periods the Board's field staff was fully occupied, and between these tests the recording of the data derived therefrom left little time available for the policing of the field. As far as possible this was done, but no efficient policing of the field can be accomplished unless meters are placed on all producing wells. Once this is done efficient records can be kept of gas production at all times at comparatively small cost.

Although the field tests were far from complete, the Board deemed it advisable to fix the 30th day of September for the opening of the public inquiry provided for by Section 18 of the Act, but the attention of the interested parties was called to the fact of the incompleteness of these tests and the obvious necessity of an enlargement of the hearing. After further adjournments, the date of the public inquiry was finally fixed for the 9th of January of this year, but owing to certain injunction proceedings that had been initiated, the commencement of the actual hearing was delayed until the afternoon of the following day.

Prior to the date mentioned, the Board had sent out to all operators drafts of two alternative plans of conservation which they were asked to consider in order to be in a position to discuss and criticize them at the hearing. When the inquiry proceeded, the Board invited the fullest discussion of these plans and also of the other matters material to the questions involved.

A transcript of the proceedings and of the evidence submitted at the public inquiry is being transmitted along with this report.

General Conditions in the Turner Valley Field.

Before dealing with the question of conservation in any form whatever, it may be advisable to refer to the conditions now existing in the Turner Valley field. A large portion of the field, that which has been closely drilled and where the wells have been operating for a considerable period of time, shows very marked signs of depletion. On the other hand, there is an area in the northern end where the pressures are still high, while in the southern end of the field the wells are comparatively recently drilled and show high pressures and large naphtha production.

It must be borne in mind that, generally speaking, the wells in Turner Valley were not drilled with any idea of obtaining revenue

from gas production. They were drilled with the sole object of obtaining naphtha production, and it is doubtful whether, at least until recently, sufficient thought was given to the fact that the gas energy supplies the necessary power to bring any free naphtha into the hole and lift it to the surface, or to the further fact of relative efficiencies of naphtha production at varying gas back pressures. Apart from the Royalite Company, which has a monopoly for the supplying of gas to the Canadian Western Natural Gas, Light, Heat and Power Company, Limited, gas production was considered a necessary and possibly unwelcome accompaniment of naphtha production.

In the depleted area referred to there is a considerable number of wells where the pressures have fallen to the point where only a very small naphtha production is obtained. The gas oil ratios in these wells have steadily grown worse, in many cases running as high as 400,000 cubic feet or more to a barrel of naphtha, while in a few cases the gas oil ratios are so high that the wells should not be treated as other than dry gas wells. Many of these wells, indeed, have reached the stage when their operation as commercial propositions can only be expected to continue for a very short time, and it might be said that, while it is not definitely known at what pressure naphtha production will cease, the period of naphtha production of these wells will be over in another two or three years at the most. In the meantime, they are drawing on the common energy of the whole field, an energy without which naphtha recovery will be practically impossible. Entirely apart, therefore, from the question of wastage of gas as a commodity of value, the conservation of that energy is a matter of vital importance to the field as a whole.

Gas and Naphtha Production in the Field.

The total annual production of gas and naphtha in the field to the end of 1932 and the average daily production of gas and naphtha with average daily gas oil ratios for each month during the years 1930, 1931 and 1932 are shown in the two tables following. The records have been supplied by the Petroleum and Natural Gas Division of the Department of Lands and Mines. The average daily production monthly during the last three years is also shown in graphic form in a chart attached hereto and identified as Appendix "D".

ANNUAL PRODUCTION OF NATURAL GAS AND OF NAPHTHA IN THE
TURNER VALLEY FIELD

	Gas 1,000 cubic ft.	Naphtha barrels	Gas Oil ratio
1925	8,760,000	165,717	52.9
1926	8,800,000	211,008	41.8
1927	13,870,000	290,270	47.8
1928	21,320,000	410,623	51.9
1929	61,450,000	908,741	67.6
1930	114,080,000	1,314,039	86.8
1931	169,280,000	1,345,689	126.0
1932	111,080,000	854,116	130.0

AVERAGE DAILY PRODUCTION OF NATURAL GAS AND OF NAPHTHA IN THE TURNER VALLEY FIELD

	1930				1931				1932			
	Naphtha Bbbs.	Gas M.c.f.	G/O Ratio	Number Producing Wells	Naphtha Bbbs.	Gas M.c.f.	G/O Ratio	Number Producing Wells	Naphtha Bbbs.	Gas M.c.f.	G/O Ratio	Number Producing Wells
January	2,646.3	173,220	65	32	5,147.6	519,523	101	74	2,583.4	378,101	146	88
February	2,529.3	172,510	68	32	4,901.2	529,400	108	78	2,571.9	376,954	146	88
March	3,201.9	232,000	72	35	4,512.5	525,755	116	79	2,603.0	406,980	156	88
April	2,768.4	196,610	71	40	4,422.7	547,116	124	79	2,609.3	436,030	167	88
May	2,756.8	180,920	65	44	4,370.0	580,505	133	83	2,496.4	345,267	139	89
June	3,357.3	249,200	74	51	4,216.1	586,630	139	84	2,463.7	327,672	133	90
July	3,234.7	248,500	77	55	3,196.4	423,796	132	85	2,337.2	266,842	114	90
August	3,721.5	373,900	100	58	2,695.5	368,113	137	85	2,212.4	224,245	102	90
September	3,951.4	397,310	100	60	2,761.5	379,400	136	86	2,092.0	234,246	112	90
October	4,840.0	495,945	102	66	2,601.7	367,055	141	86	1,996.2	218,176	110	90
November	4,169.3	480,650	103	66	2,672.6	363,444	136	86	2,015.3	232,655	115	90
December	5,341.3	540,150	101	71	2,810.2	381,676	136	87	2,070.4	211,715	102	90

RESULTS OF TEST WORK CONDUCTED BY THE BOARD.

The results of the Board's field tests are briefly set out in the following appendices:

1. Tabulated statement showing data compiled from field tests and being Appendix "A" to this report.
2. Isograph pressure map of the field, being Appendix "B" hereto.
3. Chart showing 72-hour closed pressure and rate of naphtha recovery during the ten-day test and the gasoline content of tail gas, being Appendix "C".

Analysis of Waste Gas.—It was felt desirable by the Board, when the tests were inaugurated, that an analysis of the gas, after leaving the separators—commonly referred to as "tail gas"—should be made during the period of the carrying on of these tests for the purpose of determining its gasoline content. This was done, the result showing that the present method of the separation of the naphtha from the gas adopted in Turner Valley, leaves a large amount of naphtha unrecovered, this amount being included in the residue gas, the greater part of which is burnt, the balance being used in the Gas Company's system. Elimination of this waste by a more efficient method of separation would substantially increase the naphtha production in the field. The loss in the high pressured wells is much less than in the wells where there has been a heavy decline in pressure. In many of the latter wells, this loss amounts to several times the naphtha actually recovered. It is only fair to say that the Board's figures in this connection include the high volatiles which it may be impossible to utilize, but even making allowance for this fact, it is apparent that the present separation methods are decidedly wasteful.

The results of the analysis of tail gas are shown in the tabulated statement, Appendix "A", and the chart comprising Appendix "C".

Area in the Field.

In arriving at any conservation plan, it has been necessary to endeavour to determine the amount of acreage which can be fairly considered as producing or potential producing. This acreage is described in the plan submitted by the Board as acreage on structure.

The boundaries of the area, as determined by the Board, are shown in the accompanying map (Appendix "B"). The eastern boundary is determined by the eastern limit of the producing limestone. It has been found from the data obtained in drilling operations that the limestone is cut off towards the east by a thrust fault which extends in a northerly and southerly direction throughout the field. The boundary as drawn represents, to the closest approximation from the data, the eastern limit of the producing limestone. The wells situated east of this line have failed to encounter the limestone, but have encountered the plane of the fault which has been responsible for the removal of the limestone out of reach of possible production. The data used in this determination are on record in the Petroleum and Natural Gas Division of the

Lands and Mines Department, being set out in Appendix "E" hereto attached.

The western boundary is the boundary between the Belly River and Benton formations. The dips are on the whole fairly steep to the west, and the elevation of the surface increases sharply westwards to the Belly River shales. Because of these two facts, the depth at which the limestone would be reached increases rapidly towards the west, and the boundary may be taken in the light of our present knowledge as the probable western limit of economical drilling. There is attached to this report, as Appendix "F", the map of the Dominion Department of Mines, on which this boundary is based.

At the south end of the field, the dips in the somewhat limited exposures are sharply southwards. Here, too, the boundary is drawn to represent in the light of present knowledge a probable southward limit of economical drilling. At the north end, the boundary is drawn approximately one-half mile north of the most northerly productive well. Wells hitherto drilling north of this boundary line have not encountered productive strata.

It will be noted that the northern, western and southern boundaries are not defined by structural breaks in the formation. It is not improbable that further drilling will give information which will necessitate changes in these boundary lines. The Board feels that the area as defined should be taken in the first instance and that revision should only come when the data of production are revised as a result of the operation of the field over a period of a year. The acreage of the area delimited by the Board is 8,521.3 acres.

An application was made by Model Oils, Limited, to have its acreage withdrawn from the conservation area, on the basis of a submission that Model Well No. 1 was drawing its oil from an independent geological structure. The Board feels that the geological evidence is not sufficiently conclusive to warrant the withdrawal of this acreage from the conservation area. On the basis of the distinctive character of the well, however, both with regard to oil and gas oil ratio, Model Oils, Limited, is given special consideration in the proration plan as submitted by the Board.

FINDINGS OF THE BOARD

The Board is required under the terms of the Act (Sections 15 and 16) to make certain findings, which in so far as it has been possible to do so, are now set out.

(a) *Reserves of Gas.*

The Board is convinced that reserves of gas in this area or in any part of it, cannot be estimated with mathematical accuracy on the basis of the data obtained during the test work conducted by the Board or by comparisons of well pressures secured by the Department of Land and Mines in 1931 and those obtained by the Board in 1932. The Board believes, however, that an estimate of 512 billion cubic feet of gas, available above 400 lbs. pressure, as at the end of November 1932, or a gas flow of 57½ billion cubic feet per 100 lbs. of pressure drop is a reasonable minimum estimate of the reserves of gas in the field.

This minimum estimate is based upon the estimated gas flows and measured pressure drops recorded in the tests made between July 4th and October 27th last, compiled separately for each of eleven regions in the field, and the average of 24 hour closed pressure of each region as compiled by the weighting of equal pressure areas from the Board's pressure isograph map showing assumed pressure contours as of November 24th, 1932.

The minimum reserves are estimated on the basis of gas available above 400 lbs. pressure per square inch for the reason that this pressure is assumed as being the lowest average pressure at which gas in Turner Valley could be collected, treated and sold without repressuring. There would still be left available in the field 230 billion cubic feet of gas, a portion of which could be used by repressuring.

The possibilities of variation of any estimates of gas reserves in the area, as made by competent authorities, are well illustrated in the estimates submitted to the Board at the public inquiry, and cited hereunder. These estimates tend to confirm the Board's estimate as a minimum.

Doctor Oliver B. Hopkins, a geologist representing the Imperial Oil Company, estimated the reserves at 70 billion cubic feet per 100 lbs. of pressure decline, or 600 billion cubic feet down to 400 lbs. pressure, with an additional 280 billion cubic feet down to atmospheric pressure.

Mr. B. F. Hake, representing a large number of independent operators in the field, submitted two estimates, the higher of which indicated reserves of 723 billion cubic feet down to 400 lbs. pressure, with an additional 323 billion cubic feet down to atmospheric pressure. This estimate was based on a gas flow of 80 billion cubic feet per 100 lbs. of pressure decline. Mr. Hake's lower estimate was 593 billion cubic feet down to 400 lbs. pressure, with an additional 390 billion cubic feet down to atmospheric pressure.

Mr. Stanley J. Davies, a geologist representing Mercury Oils, Limited, Miracle Oils, Limited, Mill City Petroleum and the East Crest Oil Company, Limited, estimated reserves at 476 billion cubic feet above 400 lbs. pressure, but qualified his statement with the opinion that this estimate was probably high. It was understood that this estimate was based upon the calculation of reserves by regions.

Mr. S. E. Slipper, geologist for the Canadian Western Natural Gas, Light, Heat and Power Company, Limited, discussed at considerable length the difficulties of estimating reserves with the data available. He had finally decided to base his estimate on an assumed original rock pressure of 2,050 lbs., a present (November, 1932) average rock pressure of 1,220 lbs., and a total gas flow to that date of 477 billion cubic feet. These data show a gas flow of 57.4 billion cubic feet per 100 lbs. of pressure decline and indicated gas reserves of 470 billion cubic feet above 400 lbs. pressure and 701 billion cubic feet down to atmospheric pressure. This estimate was further qualified by evidence that it would be reduced if consideration were given to deviation in certain gases from the general principles of Boyle's law of pressures and volume.

It is apparent that before a reasonably accurate measurement of these gas reserves can be made, the entire field must be put on a metered basis so far as gas production is concerned and closed in pressure tests carefully taken at least once, if not oftener, each year. A uniform method should be adopted for arriving at an average pressure for the field during the period of each pressure test.

In the estimation of gas reserves, the Board has not considered the question of danger to the field from water, there being no evidence of destructive water encroachment.

(b) The probable lifetime of the field is, of course, dependent on the one hand on the size of the reserves, as to which the Board at present can only make a minimum estimate and, on the other hand, upon the rate at which the gas is drawn from the field. With the necessity of observing the gas flows and closed pressures of the wells for at least a year more, for the purpose of determining more definitely the question of reserves, it is impossible to estimate the length of time that the field will continue to produce. Furthermore, it appears to be the unanimous opinion of the operators, and it is also the opinion of the Board, that no definite plan of conservation should at the present time be effective for a greater period than a year, and that at the end of that year, it should be varied in accordance with the new data then available. While, therefore, it might be said that conservation at a constant rate such as the Board has recommended later on in this report would mean operation of the field for a period of approximately seven years down to a pressure of 400 lbs., it cannot be assumed that the rate of restriction will be uniform over that period, but the production will gradually suffer further curtailment from time to time.

(c) The estimate of the immediate and prospective requirements of gas for domestic and industrial use offers little difficulty. The annual consumption of the Canadian Western Natural Gas, Light, Heat and Power Company's system at the present time is approximately seven billion cubic feet. Another billion cubic feet or so is used by Imperial Refineries and a certain amount will be used in the field. An estimated requirement of ten billion cubic feet per year for the next few years would appear reasonable.

(d) Some three years ago a committee on conservation, representing the Dominion and the Province, went at considerable length into the question of the use of natural gas for industrial purposes. Various uses were suggested to that committee and investigated, such as the manufacture of carbon black, benzol and other products. More recently, Dr. Boomer, of the University of Alberta, has carried on in Calgary further large scale research work on the pyrolysis of the Turner Valley gas, for the recovery of light oils and tar. The results have been attractive, and estimates of the cost of a commercial unit have been prepared.

The difficulty about the establishment of any industries to utilize gas for purposes such as have been mentioned, is the lack of a market for the product, large enough to warrant the investment necessary for such an enterprise. It may be said that the amount of gas that any industry would require would not be large, in comparison with the present production, but even so the assurance of a

long lifetime for the field would be essential if it were found that such industry was commercially possible.

(e) Methods of effecting conservation are dealt with later on in this report and certain definite recommendations are made in regard thereto.

(f) The measured value of each area and of gas and oil rights in the field has been dealt with on a comparative basis only. The result of an attempt to arrive at an actual monetary valuation of the different properties in the field would be difficult as well as unsatisfactory, as such values must vary from time to time not only in accordance with prevailing prices of petroleum products, but also according to prevailing conditions. Any values arrived at by the Board merely appear expressed in the allowance of gas allotted to each well or property and appear in the plan dealt with later on in this report.

(g) The total daily gas production which may properly be allowed in the field is discussed in connection with the plan the Board is submitting herewith.

Conservation by Pooling.

As already indicated, one of the responsibilities of the Board was to endeavour to promote voluntary pooling. Pooling, however, can only be carried forward systematically if accurate data are available of the productive capacity of the individual wells and of the potential production of undrained acreage. Naturally, before any pooling negotiations were undertaken, the operators desired that the data resulting from the Board's tests should be available.

Apart from this, any unitized operation of the field, whether on a voluntary or compulsory basis, appeared to present two major difficulties. The first of these, encountered prior to the advent of the Board, was that no agreement could be reached between the operators as to the method of representation of the various interests on the managing board. The second difficulty related to the measurement of value of the various properties. In the study of the data which have been accumulated from the field tests, the Board arrived at the conclusion that it would be unwise to endeavour to establish values on individual properties without continuous operation of the field under recording meters, over a period of at least one year. The main problem is that of potential reserves in undrilled acreage on which, at best, under the data now available, only a minimum estimate can be placed.

A study of the data secured by the Board during tests, presents some interesting sidelights on the importance of pooling of interests in the field and the conservation of gas energy that might thereby be effected through the closing down of low pressure, high gas oil ratio wells and the general benefits that would accrue to the field as a whole.

The results of the ten-day tests on 84 wells, showing gas and naphtha production, operating at 66 2/3% of closed in rock pressures, are given with other data in Appendix "A" to this report.

An analysis of these records, including as production all naphtha obtained by blowing, shows that 23 wells, each having gas oil ratios under 125 M.c.f., were capable of producing at that back pressure, 2,295 barrels of naphtha with 149,561 M.c.f. of gas, or at a gas oil

ratio of 65 M.c.f., while 61 wells, each having gas oil ratios higher than 125 M.c.f., operating under the same percentage of back pressures, produced only 856.8 barrels of oil with 248,041 M.c.f. of gas, or at a gas oil ratio of 289 M.c.f.

The figures are tabulated hereunder, showing totals by groups of wells:

	Ten day test on 61 high gas oil ratio wells		Ten day test on 23 low gas oil ratio wells		Totals	
	Gas Prod'n M.c.f.	Naphtha Barrels	Gas Prod'n M.c.f.	Naphtha Barrels		
Independent	87,604	333.6	69,085	969.8	156,689	1,303.4
Imperial Subsidiary....	103,080	384.4	52,045	590.5	155,125	974.9
Imperial Contract	57,357	138.8	28,431	734.7	85,788	873.5
Imperial	160,437	523.2	80,476	1,325.2	240,913	1,848.4
TOTAL.....	248,041	856.8	149,561	2,295.0	397,602	3,151.8
	Gas Oil Ratio 289		Gas Oil Ratio 65		Gas Oil Ratio 126	

The daily average production of the field in the month of December, as reported by the Department of Lands and Mines, was 2,070.4 barrels of naphtha, produced with 211,715 m.c.f., or at a gas oil ratio of 102 M.c.f. The 23 wells, comprising the high pressure low gas oil ratio group above referred to, contributed to December production to the extent of 1,563 barrels, obtained with 75,720 M.c.f. of gas, or at a gas oil ratio of 48 M.c.f. As the wells are not metered and there may be a disposition to understate gas production, these gas production figures may be open to question. The correction of any error in this direction would merely strengthen the basis for the following conclusion.

It is apparent, therefore, that as shown by the ten day tests, 23 wells, when operated at 66 2/3% closed in rock pressure, were capable of producing more naphtha from 150,000 m.c.f. than was produced from the entire field in December from over 211,000 M.c.f. It would thus seem to be a reasonable deduction that really effective measures of conservation in the field should be brought about by the complete closing in of wells when these have reached a high gas oil ratio stage.

While some form of agreement, pooling or unitized operation of the field involving the closing down of wells having high gas oil ratios would undoubtedly result in the most efficient form of operation and conservation of gas energy, the Board would hesitate at the present time to recommend that it be brought about by compulsion.

Any plan of conservation that is attempted to be based upon relative operating efficiencies of the various wells in the field, particularly in so far as naphtha recovery is concerned, cannot but appear to bear harshly upon those wells with depleted pressures and high gas oil ratios. On the other hand, to adopt any scheme which does not stress efficient operation means the penalizing of efficient wells and must diminish naphtha production, for it must encourage the heavy use of gas energy to recover small amounts of naphtha.

The tendency on the part of the operators of these low pressure wells is to continue operations regardless of the effect their method of operation may have upon the field as a whole. Without any form of limitation of production, they would probably continue to

operate their wells until the pressure had decreased to such an extent that the lifting power for the naphtha was gone. There are one or two cases at present where the return from operation is barely sufficient to pay the men operating the separators.

The operators of some of the more efficient wells have pointed out that these low pressure wells have, to a large extent, obtained their possible naphtha production and that the stage of wasteful operation which has now been reached must result in penalizing those operators who, warned by the results of the inefficient operation of other wells, have endeavoured to operate efficiently from the outset. It is hoped that some measure of pooling may be accomplished under the Board's proration plan, as that appears to offer some solution of the difficulties that must be encountered by those companies operating low pressured wells.

Again, in the operation of these inefficient wells, the adoption, if feasible, of a less wasteful method of blowing the wells may afford some solution. In many cases, it is usual at present to obtain naphtha production by blowing, but between blowing the gas flow is continued with the result of an excessive use of gas for the amount of naphtha recovered.

It is also probable that through the tubing of some of these wells, considerably greater naphtha may be recovered with considerably less gas consumption. No proper trial of this practice has been attempted in Turner Valley, although it has long been in use in other fields.

Conservation by Proration.

In the place of any voluntary pooling which, at the present time does not seem feasible, if the whole field is to be covered by such pooling, and in the place of any compulsory unitized operation of the field, the Board believes that conservation at the present time can be more readily effected through putting into effect a plan of proration of gas to be allowed to be produced in the whole field.

At the public hearing, Mr. B. F. Hake, representing a number of the smaller companies, submitted a plan of proration, based upon a daily allowance for the field of 300 million cubic feet of gas. Under this plan each well was to be required to produce under a back pressure, not less than a certain percentage of its recent twenty-four hour closed in pressure, this percentage to be a uniform one throughout the field. Actual back pressures to be carried by each well were to be revised annually in the light of future observation of closed in pressures and when practicable, bottom hole pressures should be substituted for closed in pressures. Each operator was to be permitted to blow his well or wells under certain restrictions and, where the system of proration suggested appeared to unduly penalize an operator, special consideration should be given to his well or wells. All restriction as to export of natural gas from the Province was to be removed and either the common purchaser principle with respect to natural gas was to be brought into effect or compensation paid to the operators by the Gas Company. Finally, a revision of the taxes on mineral rights and oil production was suggested.

In regard to this plan, it may be said that it is based upon Mr. Hake's estimate of gas reserves, which estimate very considerably

exceeded those of any other witnesses at the inquiry. Proration on the basis suggested means the withdrawal of 110 billion cubic feet of gas a year at the outset. In the Board's opinion the data available do not warrant the adoption at the present time of conservation on as generous a scale as suggested. It may be said also that such proration allowance would probably result in the production of naphtha beyond the market needs, while it is more than doubtful whether some at least of the companies represented by Mr. Hake, would be placed in any better, if as good, a position, as they are now in under the proration now in effect.

There are two essential elements which should be considered in any proration plan. The first is that it should permit as great a measure of flexibility in operation as possible, so that the operators may have within the limits of the conservation programme the fullest freedom to operate as may seem to their best advantage. The second is that the plan should put as great a premium as possible upon efficient operation within the limits of the conservation proposed.

The Board has, with the assistance of its advisory engineer, worked out a plan of gas proration in the field, as set out in detail in Appendix "G" to this Report. The gas allowance to each operator or owner of gas and oil rights within the area is based in part upon acreage on structure, weighted by average pressures and in part on actual efficient naphtha production as determined by test.

Prior to the public inquiry, a draft of substantially the same plan was sent out by the Board to the various parties interested, and the fullest discussion of the plan was invited at that inquiry. It may be said that there appeared to be no objection to the principle of proration, and the principles of the plan itself were not subject to any great criticism, although it is only fair to say that Mr. Hake, in presenting his own plan, already referred to, may be considered as disagreeing.

In the operation of this plan, a gas quota assigned to a particular holding may be used on any well or wells in that holding and under any method of production which may be to the greatest benefit of the operator. He may operate at any pressure which he may deem advisable. He may conserve the gas allowance at certain periods of the year in order to have it available in greater amount at such times as the demand for naphtha is greatest, always provided that no more gas is allowed to escape during the year than would be permitted under the quota. If he cannot use the quota which has been assigned to his holding, under the plan, whether because there is no well on the holding or because production cannot efficiently be obtained from the well or wells which exist, he may make arrangements to transfer the quota by sale or otherwise in order that it may be used to increase naphtha production elsewhere within the Turner Valley area. The only limitation to the transference of quotas would be that differences of pressures on adjoining wells on neighbouring properties should not be permitted to the extent that undue depletion of the reserves on any property would occur, because of the much lower back pressure at which the well or wells on adjoining properties were operating. It would be the responsi-

bility of the supervising engineer to see that this safeguard be maintained.

The plan promotes efficient operation of the field because it is to the advantage of the operator to obtain the greatest amount of naphtha possible from the gas which has been allowed him. The value of his production is mainly in naphtha and only secondary in gas, even if he obtains a market for the gas. The gas quota will, therefore, be used in such a way as to obtain the greatest amount of naphtha under the conditions which prevail in any well or group of wells in a holding. If this quota is transferred to another holding, the operator who has the lowest gas oil ratio can offer the best terms for the quota to be transferred because it is of most value. Transfers might be expected, therefore, to take place in the areas of efficient production in the field.

There is also a premium on efficiency of operation in the structure of the plan itself. As will be noticed by an examination of the details of the plan and the accompanying explanation, the proration quota is made up in part from the naphtha production of the wells and in part from the acreage potential, that is, the product of acreage and its average available pressure. The proportional weight given to naphtha production, as compared to acreage potential, is approximately as 30 to 70. Under this plan the more efficient the production, the lower is the gas oil ratio, in other words, the larger is the proportional quota. The operator who is producing under the lowest gas oil ratio possible for his wells obtains a higher gas quota in subsequent revisions than the operator who obtains the same amount of naphtha at a greater expenditure of gas because of the fact that the acreage potential is maintained at a higher level under efficient production methods when gas is not unduly wasted. The structure of the plan itself, therefore, and the effect of the revisions which will take place from time to time, as further data are established, together tend to promote the highest efficiency of operation in the field, short of establishing hard and fast rules for the individual operator.

It might also be pointed out that in future revisions of the plan on the basis of revised data respecting acreage, average pressures and naphtha production, automatic curtailment of the total gas allotment to the field would be secured by maintaining in such revisions substantially the same unit quotas as are now set out in the plan submitted, namely, 19.11 thousand cubic feet per barrel of naphtha produced, 26,291 cubic feet per average pressure acre for drilled acreage, and 13,145 cubic feet per average pressure acre for undrilled acreage.

It will be seen by a reference to the plan itself that while a total daily gas allowance of 200 million cubic feet is contemplated, an amount of 10 million cubic feet has been set aside out of that amount to meet any proration allowances for naphtha production that may require to be given in the case of new wells coming in, and also to cover certain allowances that have been or may have to be given to two very low gas oil ratio wells as well as to cover any readjustments that may have to be made in the case of producing wells.

Compensation.

One of the purposes of the public inquiry provided for in the Act was the ascertaining by the Board of the net detriment suffered and benefits derived by any person or group of persons through conservation of gas. No evidence along these lines was offered at the hearing, it being apparently the unanimous opinion of the operators that the question of compensation could not be intelligently discussed or dealt with until any conservation plan that might be adopted should be in effect for at least a year. It is quite apparent, therefore, that the question of compensation should be left entirely open and be determined later on by some body selected for that purpose.

RECOMMENDATIONS

In conclusion, the Board begs to recommend as follows:

1. *Removal of restriction of drilling.* That in view of the fact that a definite restriction of the total gas production in the field is recommended under the plan submitted by the Board and that the drilling of wells will not materially affect the total allotment of gas for the field, any restrictions that may be now in effect as to drilling into the limestone in Turner Valley be rescinded.

2. *Installation of meters and pressure gauges.* That Sections 31 and 33 of the regulations respecting drilling and production operations of oil and natural gas wells (Order in Council 769/31), dealing respectively with the taking of closed in pressures and of the measuring of gas production by meter, be strictly enforced in the field, in order that more accurate information may be available in the future on which to base estimates of gas reserves, and on the basis of which revision may be made from time to time of the gas proration plan recommended in the next section.

3. *Gas Proration Plan.*

(a) That as soon as it may be found convenient, the present restricted production of gas in the area under the Board's Order No. 20, be replaced by a gas proration plan in which a gas production allotment is made to each and every owner of oil and gas lands lying within the assumed boundaries of the productive gas horizon in the Turner Valley area, as shown on the Board's pressure isograph map and Appendix "B", based upon acreage, estimated average pressures and efficient naphtha production in the manner shown in detail in the plan, being Appendix "G" attached hereto, and that the proration of gas production be administered by such authority as the Legislature may determine.

(b) That until a revision of the plan is made after the first year of operation, any additional allotment arising out of the bringing into production of new wells or for any other reason, shall be met out of any available allotment not being used and, if necessary, by an increase in the total daily allotment. The allotments as set out in the plan should be effective for one year and be revised thereafter at such periods as may be found expedient, on the basis of revised data respecting acreage, average pressures and naphtha production, and having regard to the possible desirability of a further reduction in the total daily allotment.

(c) That in the enforcement of this plan, sufficient flexibility be allowed to permit of the most efficient use of gas quotas. To this end, operators should not be arbitrarily restricted to the fixed daily quota, but should be permitted to accumulate such quotas for any type of more efficient operation. Similarly, transfers of quotas from one owner to another by sale or lease of gas and oil rights should be facilitated in order that the owners of lands who have not drilled may find a market for their holdings. All such flexibility, however, shall be subject to the proviso set out in the next subsection.

(d) That in the operation of this plan, accumulations of gas quotas shall not be used on any one well or any group of wells so as to excessively drain any particular area.

(e) That in preparing future revisions of this plan, the recovery of natural gas gasoline from the gas from any well be included with naphtha production for the purpose of determining gas allotments.

4. *Compensation.* That the question of the determination of compensation to individual oil or gas operators in the area be deferred for consideration by such body as the Legislature may appoint after the proration plan herein recommended, has been in operation for the time indicated.

5. *Further Study of Records.*

(a) That all the records and information collected by the Board be referred to the Petroleum and Natural Gas Division of the Department of Lands and Mines or such other authority as may be determined, for further detailed analytical study when the additional data respecting changing pressures and operating conditions in the field during the coming year are obtainable, so that the fullest possible information may be available for the future determination of gas reserves and of gas conservation policy.

(b) It is further recommended that the results of these studies be brought to the attention of the operators with a view to assisting them in developing a scheme of voluntary pooling or unitized operation.

In submitting this report, the Board desires to express its high appreciation of the loyalty and efficiency of the various members of its office and field staff. Much of the work devolving on them has been both arduous and difficult, but their work has fully justified the Board in the selection of the personnel of its staff.

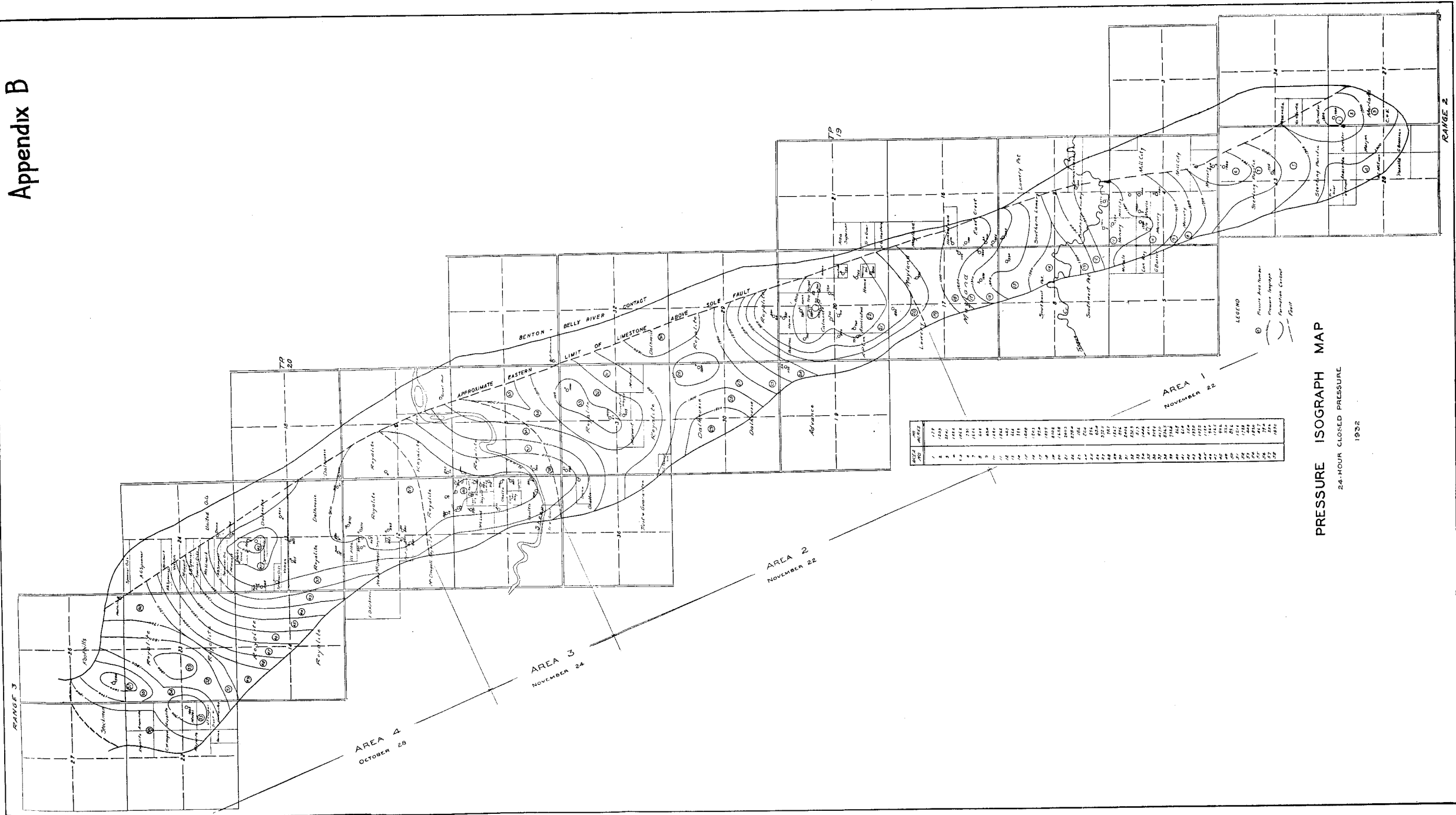
Dated at Edmonton, this 22nd day of February, A.D. 1933.

Respectfully submitted,

A. A. CARPENTER,
R. C. WALLACE,
JOHN McLEISH.

Attachments A, E, F and G of Exhibit A being bulky, are not included in the report, but copies may be obtained on application to the Division.

Appendix B



Appendix C

EXPLANATION

RATE OF LIQUID RECOVERY FROM GAS
BARRELS PER MILLION CUBIC FEET

RATE OF NAPHTHA RECOVERY
DUE TO BLOWING OF WELL

RATE OF TOTAL
NAPHTHA AND
NATURAL GASOLINE
RECOVERY

"A" IS FROM
AVERAGE DAILY
PRODUCTION DURING
FIRST PART OF
TEST WHILE WELL
WAS HELD AT
66% OF CLOSED
PRESSURE.

"A + B" IS FROM
AVERAGE DAILY
PRODUCTION FROM
ENTIRE TEN-DAY
PERIOD INCLUDING
LATTER PART WHEN
WELL WAS BLOWN.

RATE OF NAPHTHA
RECOVERY AT 66%
OF CLOSED PRESSURE

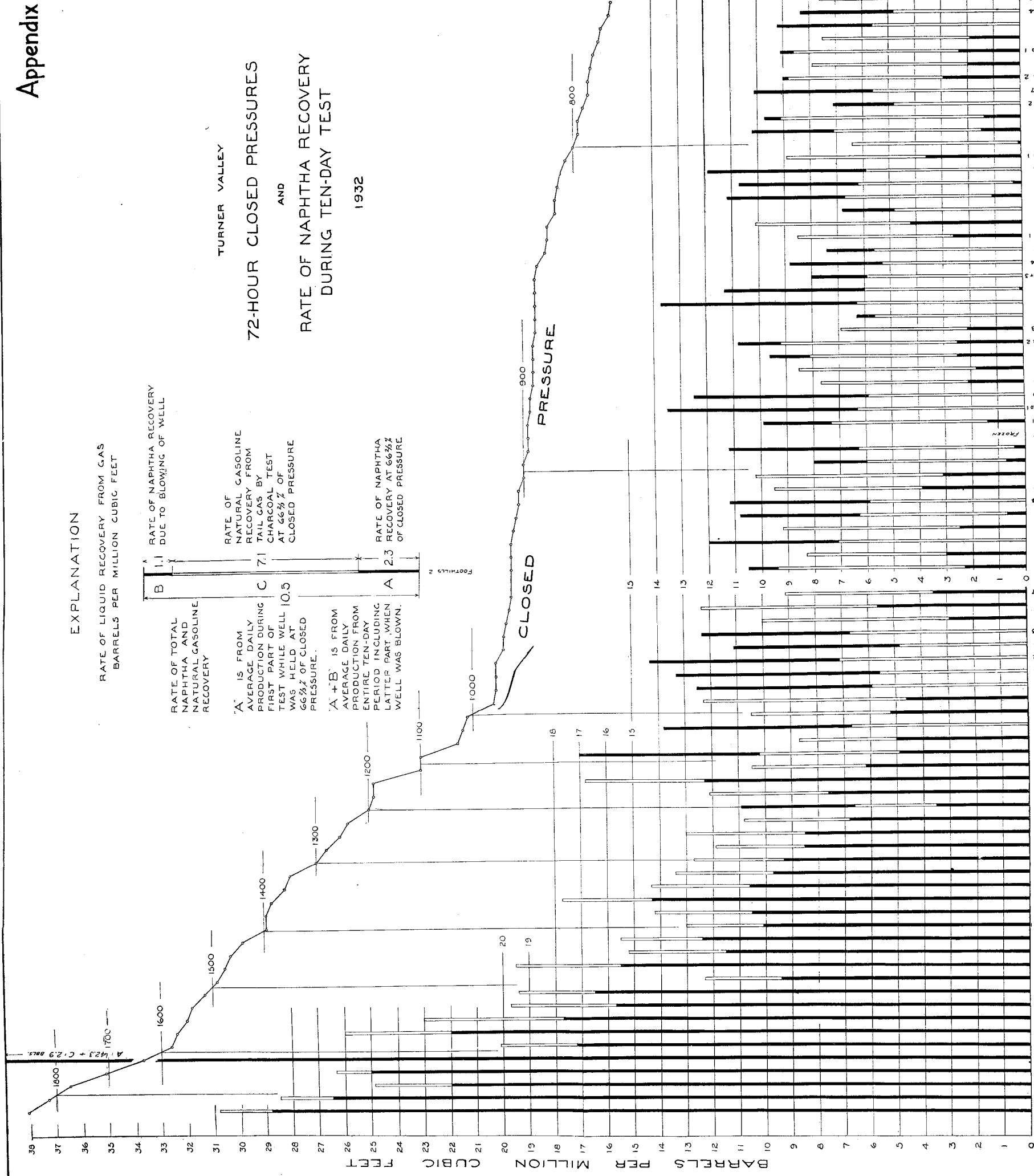
TURNER VALLEY

72-HOUR CLOSED PRESSURES

AND

RATE OF NAPHTHA RECOVERY
DURING TEN-DAY TEST

1932



Appendix D

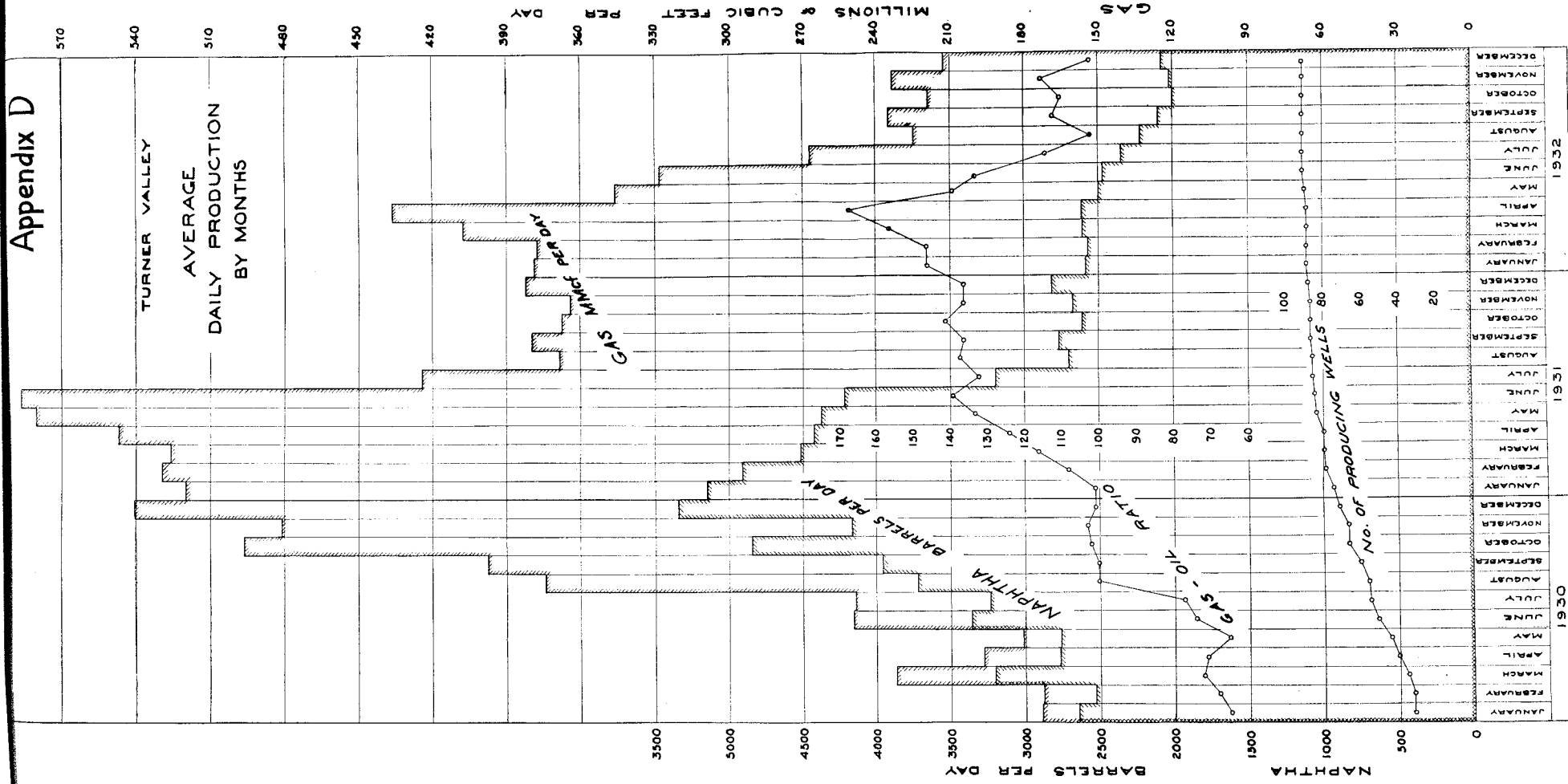


EXHIBIT B

O.C. 256/33.

Approved and Ordered,

(Signed) W. L. WALSH,
Lieutenant Governor.

Edmonton, Thursday, April 13th, 1933.

The Executive Council has had under consideration the report of the Honourable the Minister of Lands and Mines, dated April 6th, 1933, stating that by Order in Council numbered 769/31, dated July 10th, made pursuant to the provisions of *The Oil and Gas Wells Act*, 1931, regulations were made respecting drilling and production operations of Oil and Natural Gas Wells in the Province of Alberta, and that it is proper, convenient and in the public interest that the aforesaid regulations be amended as to Section 36 thereof in the manner hereinafter mentioned;

Therefore, upon the recommendation of the Honourable the Minister of Lands and Mines, the Executive Council advises that the aforesaid regulations be and are hereby amended as to Section 36 thereof, by striking out the words "When gas from any well is being used, the flow production thereof shall be restricted to twenty-five" where the same occur therein, and by substituting therefor the words, "When gas from any well is being used, the flow of production thereof shall be restricted to forty."

The said amendment to be effective on, from and after the date of this Order.

(Signed) J. E. BROWNLEE,
Chairman.

O.C. 257/33.

Approved and Ordered,

(Signed) W. L. WALSH,
Lieutenant Governor.

Edmonton, Thursday, April 13th, 1933.

The Executive Council has had under consideration the report of the Honourable the Minister of Lands and Mines, dated April 6th, 1933, stating that:

WHEREAS by Order in Council numbered 1142/31, dated November 26th, 1931, the regulations heretofore made pursuant to *The Oil and Gas Wells Act*, 1931, by Order in Council numbered 769/31 and dated July 10th, 1931, were amended by inserting therein a new regulation, numbered 45, restricting or prohibiting drilling into the dolomite limestone; and

WHEREAS it is deemed proper, convenient and in the public interest that the aforesaid regulation number 45 be now deleted and rescinded;

THEREFORE, upon the recommendation of the Honourable the Minister of Lands and Mines, the Executive Council advises that the aforesaid regulation number 45 be and is hereby deleted and rescinded on, from and after the date hereof.

(Signed) J. E. BROWNLEE,
Chairman.

O.C. 258/33.

Approved and Ordered,

(Signed) W. L. WALSH,
Lieutenant Governor.

Edmonton, Thursday, April 13th, 1933.

The Executive Council has had under consideration the report of the Honourable the Minister of Lands and Mines, dated April 6th, 1933, stating that:

WHEREAS by Order in Council numbered 644/32, dated July 19th, 1932, the regulations heretofore made pursuant to *The Oil and Gas Wells Act*, 1931, by Order in Council Numbered 769/31, and dated July 10th, 1931, were amended by inserting therein a new regulation, numbered 36A, for the purpose of conserving gas and oil; and

WHEREAS it is deemed proper, convenient and in the public interest that the aforesaid Regulation number 36A be now deleted and rescinded;

THEREFORE, upon the recommendation of the Honourable the Minister of Lands and Mines, the Executive Council advises that the aforesaid Regulation number 36A be and is hereby deleted and rescinded, on, from and after the date hereof.

(Signed) J. E. BROWNLEE,
Chairman.

EXHIBIT C

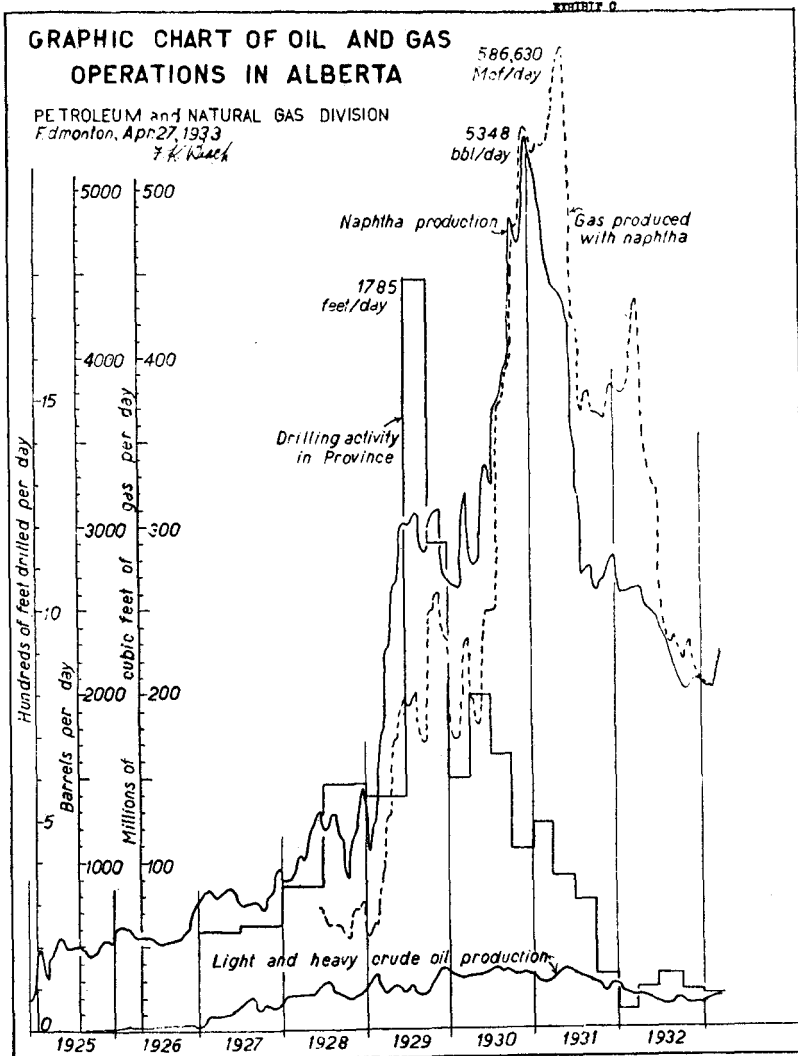


EXHIBIT D.

WELLS DRILLED AND COMPLETED DURING YEAR ENDED MARCH 31, 1933

TURNER VALLEY FIELD

NAME	Location	Drilling Started	Drilling Finished	Depth	REMARKS
Anaconda 2	15 of 28-18- 2-W. 5	28-12-32	.....	340	Drilled to 217 and skidded rig for a new start.
Freehold 4 (Marjon)	9 of 28-18- 2-W. 5	7- 4-31	5- 3-33	5,854	Large producer of gas and naphtha.
Hoffar Lundy 1	13 of 22-18- 2-W. 5	15- 3-33	.....	160	Drilling.
Hyla 1	12 of 4-19- 2-W. 5	11- 7-29	22- 6-32	5,665	Completed as good producer of gas and naphtha.
McLeod 1	16 of 1-20- 3-W. 5	10-10-23	26- 5-32	3,965	An additional depth of 91 feet drilled with negative results.
McLeod 4	16 of 1-20- 3-W. 5	13- 3-28	18-11-32	7,751	An additional 2,274 feet drilled without increase in production.
Model 2 (formerly Anaconda 1)	16 of 22-20- 3-W. 5	28- 8-29	.....	4,900	After reaching 3,954, redrilling started from 2,400; drilling continues.
New McDougall Segur 5	11 of 12-20- 3-W. 5	30- 6-32	27- 9-32	2,888	Completed as producer of light crude.
Regent 3 (Canada Southern)	16 of 1-20- 3-W. 5	3- 8-29	17- 5-32	4,450	Completed in limestone. Produces gas with very little naphtha.
Spray 1 (Associated Royalties)	9 of 5-19- 2-W. 5	11- 6-29	.....	3,320	Drilling.
Union Drilling Co. 1	8 of 21-18- 2-W. 5	31-12-32	.....	60	Drilled to 6,369, plugged back and partly redrilled.
United 4.	2 of 24-20- 3-W. 5	4- 1-28	1- 3-33	5,520	Now produces light crude.
Vanberta (Mayland-Rand)	5 of 34-18- 2-W. 5	6- 2-30	7- 6-32	264	Suspended.

RED COULEE FIELD

Devonshire 1	4 of 10- 1-16 W. 4	18- 4-30	.....	2,130	Drilling. Was suspended for some months.
Kotop 1A	1 of 2- 1-17-W. 4	29- 6-30	.....	2,080	Drilled to 2,080 and suspended for some months un-
Vanalka 5	4 of 4- 1-16-W. 4	8- 9-32	2-11-32	2,517	cased. Renewed drilling under new management. Light crude producer.

WAINWRIGHT FIELD

Beaumont 2	10 of 30-45- 7-W. 4	4-11-29	23-11-32	2,210	Testing.
Montreal-Alberta 1	2 of 15-45- 7-W. 4	5- 6-31	18- 1-33	2,885	Suspended.

FOOTHILLS AREA

Cottonbelt 1A	5 of 21-22-4-W. 5	4-12-30	16- 8-32	3,140	Abandoned.
Elbow 1	11 of 35-22-5-W. 5	9- 4-29	17-11-32	3,610	Suspended.
Moose 1 (Herron Cartage)	16 of 29-22-6-W. 5	11- 8-29	.....	2,834	Efforts to sidetrack lost tools and drill deeper.

OTHER AREAS

Athadome 1	12 of 21-72-24-W. 4	19- 5-32	23- 9-32	1,900	Abandoned.
Athadome 2	3 of 15-66-23-W. 4	20-10-32	.....	1,505	Drilling.
Cartier 1	6 of 36-31-7-W. 5	28- 4-31	8- 2-33	1,450	Suspended.
Crudome 1	9 of 8-72-24-W. 4	26- 8-31	4- 6-32	810	Suspended.
Commonwealth, Milk River 1	8 of 9- 3-15-W. 4	7-11-28	9- 3-33	5,310	Abandoned.
Frontier, Two Hills 22	2 of 1-55-13-W. 4	14-11-32	11- 1-33	2,007	Drilling.
Grey Bros. 3	1 of 32-25-2-W. 5	26-11-32	.....	200	Light crude producer.
Hudson's Bay Keho 1	2 of 17-11-22-W. 4	21- 6-30	23- 2-33	3,792	and plugged back.
Mayland Southern 1	13 of 4- 1- 9-W. 4	31- 3-31	2- 6-32	3,010	Potential gas producer.
Nordon Twin River 2	12 of 2- 2-20-W. 4	28-11-32	.....	2,353	Drilling.
Northwestern Utilities-Kinsella 1	1 of 17-47-11-W. 4	16- 5-32	11- 7-32	2,177	Potential gas producer.
Northwestern Utilities-Kinsella 2	4 of 25-47-11-W. 4	18- 7-32	20- 9-32	2,184	Potential gas producer.
Northwestern Utilities-Viking 24	10 of 32-48-12-W. 4	18- 4-32	9- 6-32	2,208	Gas producer.
Oil City 1	16 of 30- 1-30-W. 4	5-10-32	31-12-32	124	Suspended for winter.
Ranchmen's 1	16 of 13-20-29-W. 4	1- 1-27	6- 2-33	5,780	Temporarily suspended.

Forestry

REPORT OF THE DIRECTOR OF FORESTRY, T. F. BLEFGEN

This report covers the period of the fiscal year ended March 31st, 1933. During this year a number of important changes took place in administrative work and alterations in organizations were brought into being, all of which had far-reaching effects.

Economic conditions and the desire to place certain administrative work where it rightly belonged dictated the changes made in staff and the transfer of certain responsibilities to the Forest Service.

The fire season was probably one of the best ever experienced since forest protection has been undertaken. In number of fires, extent of loss from fires and cost of fire suppression the season was satisfactory. Following as it did the disastrous fire season of 1931, an immediate means of comparison was provided between what might be termed bad and good fire seasons, demonstrating the extent to which uncontrollable factors influence forest destruction by fire.

Timber operations were not extensive in size although very many small operations demanded attention keeping all timber inspectors exceedingly busy. The fact that an easier situation prevailed with respect to forest protection enabled inspection work to be kept well in hand.

Supervision of unemployment relief camps continued on a medium scale within two of the provincial forests situate along the east slope of the Rocky Mountains. This work has been practically continuous since the fall of 1930, the number of camps, of course, varying from time to time.

Administration and protection of those areas of provincial lands set aside as forest reserves continued as in the past. The work was kept in hand, and due to certain organization changes additional work in the way of timber inspection on lands outside the forest boundary was dealt with.

SCOPE OF WORK

Area.

The total area over which the forest Service is responsible for forest protection and field administration of forest resources is approximately 162,234.69 square miles. This is made up as follows: Provincial forest reserves, Cypress Hills forest reserve and Rocky Mountains forest reserve, 14,409.69 square miles, and the Northern Alberta forest district, which embraces practically all other forested territory within the Province not included in the forest reserves mentioned, 147,825.00 square miles. In addition to these districts there is a large area over which timber inspection work is carried on.

Forest Reserves.

Within the forest reserves the responsibility of the Forest Service is somewhat broader than in the Northern Alberta forest

district. The forest reserves are areas set aside for forest purposes under authority of The Alberta Forest Reserves Act. While such areas of land are withdrawn from disposition under the terms of The Provincial Lands Act or any other act, it should be understood that merchantable timber found on lands within such areas is not reserved, but may be disposed of under authority of The Alberta Forest Reserves Act and the regulations made thereunder. Under such circumstances the Forest Service is responsible for the protection and the field and office administration of the resources found on these lands. Such resources will include timber, grazing and hay. The administration is also concerned with the use of land for a variety of purposes as authorized by the regulations. It follows, therefore, that office and field organization dealing with such areas will of necessity be built along lines to deal with the work, and that improvements required for administration and protection purposes will be of a fairly permanent nature. Likewise, the interior organization of these areas will have in view a long term protection scheme.

The importance of protecting and regulating the use of forest resources within the watershed forests of the east slope is very great. The beneficial results of adequate protection and regulated use will be apparent in various ways, the most important of which are the production of merchantable timber, natural regulation of stream flow, reducing erosion, modifying of local weather conditions, game and fish conservation, and an attractive area for various forms of outdoor recreation.

Northern Alberta Forest District.

The Northern Alberta forest district is made up of forested area extending eastward from the Rocky Mountains forest reserve in the western central part of the Province, and includes practically all of the north half of the Province from which should be eliminated the agricultural districts west of Lesser Slave Lake, the Grande Prairie and Peace River districts and the Wood Buffalo Park.

Within the Northern Alberta forest district is to be found by far the greatest percentage of timber operations, and it is inside this area that the Forest Service is primarily concerned with forest protection, all field work and a very considerable amount of office work required in the administration of timber operations. Up to April 1st, 1932, the Forest Service was concerned only with forest protection throughout this district.

Authority is provided for protection purposes by The Prairie Fires Act and the regulations for the prevention of prairie and forest fires. The timber operations are carried on under authority of The Provincial Lands Act and the timber regulations. The administration of The Prairie Fires Act throughout the Province is a direct responsibility of the Forest Service. Within municipal districts the enforcement of this Act and the regulations made thereunder is a municipal responsibility.

The construction and operation of railways has always resulted in what might be termed a fire hazard to forest cover adjacent to the railway line. The Alberta Forest Service is continuing the work of the Federal body in so far as right of way inspection, special patrol by railway employees and action on railway fires are concerned. Authority for this work is secured through the

appointment of officers of this Service as fire inspectors under the Board of Railway Commissioners of Canada. Naturally the work is confined to forested territory, and includes all railway mileages within forest reserves and a large percentage of all railway mileage in the Northern Alberta forest district.

ORGANIZATION

Forest Reserves.

With a view to providing for greater economy of operation, certain changes in forest reserve personnel organization were arranged. The changes made effective concerned a number of permanent employees who became seasonal employees, the amalgamation of certain administrative areas with a reduction in supervisory officials and the withdrawal of the area known as the Lesser Slave forest reserve from the operation of The Alberta Forest Reserves Act, the area automatically ceasing to be a forest reserve and coming under The Lands Act. In line with the last mentioned change, this area became part of the Northern Alberta forest district and personnel organization as to area covered, period of employment and remuneration placed on a footing common to the Northern Alberta forest district.

Excepting for the area previously known as the Lesser Slave forest reserve, the field staff employed during the fire season remained approximately the same as heretofore. The following comparative statement of personnel employed before and after the changes referred to will show clearly the action taken:

PERSONNEL ESTABLISHMENT PRIOR TO MARCH 31st, 1932

Cypress Hills Forest Reserve:
1 permanent ranger.
1 assistant ranger, seasonal.

Crowsnest Forest Reserve:
1 superintendent.
1 forest clerk.
7 permanent rangers.
3 seasonal assistant rangers.
3 lookout men, part-time.
4 patrolmen, part-time.

Bow River Forest Reserve:
1 superintendent.
1 clerk.
1 stenographer.
8 permanent rangers.
3 seasonal assistant rangers.
9 seasonal patrolmen.
5 lookout men, part-time.
1 telephone operator, part-time.

Clearwater Forest Reserve:
1 supervisor.
1 clerk.
1 forest engineer.
3 permanent rangers.
9 seasonal assistant rangers.
2 lookout men, part-time.
1 telephone operator, part-time.

Brazeau Forest Reserve:
1 supervisor.
1 clerk.
4 permanent rangers.
5 seasonal assistant rangers.
3 lookout men, part-time.
2 patrolmen, part-time.

Athabaska Forest Reserve:
1 supervisor.
3 permanent rangers.
6 seasonal assistant rangers.
1 lookout man, part-time.
1 labourer clerk, part-time.

Lesser Slave Forest Reserve:
1 supervisor.
1 clerk.
3 permanent rangers.
7 seasonal assistant rangers.
4 lookout men, part-time.

PERSONNEL ESTABLISHMENT AFTER MARCH 31, 1932

Cypress Hills Forest Reserve:
1 permanent ranger.
1 part-time labourer.

Crowsnest-Bow River Forest Reserve:
1 clerk.
1 superintendent.
1 stenographer.
2 permanent rangers.
2 rangers, 8 mos. at \$150.00 and 4 mos. at \$75.00.
11 seasonal rangers.
11 seasonal assistant rangers.
8 lookout men, part-time.
1 patrolman, part-time.
1 telephone operator, part-time.

Clearwater Forest Reserve:
1 superintendent.
1 clerk.
1 permanent ranger.
2 seasonal rangers.
9 seasonal assistant rangers.
2 lookout men, part-time.
1 telephone operator, part-time.

Brazeau-Athabaska Forest Reserve:
1 supervisor.
1 clerk.
1 permanent ranger.
1 ranger, 8 mos. at \$150.00 and 4 mos. at \$75.00.
6 seasonal rangers.
11 seasonal assistant rangers.
4 lookout men, part-time.

Slave Lake Division of the Northern Alberta Forest District (includes only personnel required for former Lesser Slave Forest Reserve which makes up a portion of Lesser Slave division):
1 timber inspector.
5 seasonal fire rangers.
4 lookout men, part-time.
1 telephone operator, part-time.

Northern Alberta Forest District.

Within the Northern Alberta forest district the area was and is divided into ranger districts in which seasonal rangers are employed during the period of the fire season. Prior to April 1st, 1932, these ranger districts were grouped for purposes of supervision into four fire ranger sub-districts with a sub-chief ranger in charge of each group. Under this arrangement it was not possible to provide for a satisfactory degree of supervision for the reason that the area within each sub-district was extremely large with communication in the majority of instances non-existent and travel by available means very slow.

In the spring of 1932 it was decided that the Forest Service of the Department of Lands and Mines should assume responsibility for all administration and field work in connection with the timber resources of the Province. Prior to that time all work connected with timber operations outside of the forest reserves was dealt with by the Lands Division of the Department. The Forest Service head office staff was accordingly augmented to deal with the departmental records and correspondence taken over from the Lands Division, and the chief timber inspector and all timber inspectors were transferred to the Forest Service. Two sub-chief fire rangers were made timber inspectors. All Crown timber agency office work continued to be handled by the respective land agents with the exception of records of inspection work.

The transfer of timber inspectors had also in view the correction to some extent of the situation previously referred to in respect to field supervision of rangers. Accordingly the ranger districts were re-grouped into smaller groups, now called divisions, and a timber inspector placed in charge of each group for purposes of forest protection and timber inspection. Eight such divisions were formed, which had the result of very considerably reducing the area under supervision of each timber inspector as compared with that previously supervised by the sub-chief rangers, and likewise this move reduced the number of rangers under each supervisory officer.

The result of this re-organization in the Northern Alberta forest district is already apparent, both in the timber inspection work or what might be termed field administration of timber operations and in a betterment of protection effort. While timber inspection work is now on a better basis than heretofore, and is receiving satisfactory attention, much remains to be accomplished on protection work. This is equally true both in respect to fire prevention and fire suppression.

A large percentage of the areas within the forest reserves are absolute forest lands, that is, lands suited only to the growing of trees. As a result of this, the organization built up to administer these areas is concerned primarily with matters relating to the practice of forestry and, in the main, forestry in its various branches is the first concern. It is, therefore, understandable that within the forest reserves the effort towards forest protection is emphasized, and that every reasonable effort is made towards fire prevention and fire suppression, and that the use of resources found within the reserves is regulated by the requirements of forest protection and with the improvement of the present forest in view. Facilities for communication and fire detection have been installed, and routes

of travel consisting of roads and trails have been constructed. Field headquarters for rangers and other officers have been built at locations suitable for administrative and protective purposes, and equipment for the maintenance of these improvements and for fire-fighting purposes made available.

In the Northern Alberta forest district the situation is very different. In this large district there are many areas of land suitable for agricultural purposes though bearing at the present time stands of timber in various stages of growth. For many years the forest area has been receding before the advances of land settlement, and this movement will continue so long as suitable agricultural lands are found within reasonable distance of transportation. Settlement directly and indirectly has been responsible for the large reduction in the forested area of the Province, first through the clearing of lands filed on and then by the large number of fires originating from land clearing operations which are allowed to run unchecked and thus destroy large areas of valuable forest. Timber operations, resulting in the removal of forest cover, have made considerable areas available for settlement. Thus the situation in respect to large tracts of land is gradually changing, and the final disposition of many areas now bearing tree growth will eventually be for agricultural purposes. Under such circumstances the formation of an organization such as is found in the forest reserves is not justified for the entire area. It should be understood, however, that within the Northern Alberta forest district a large percentage of land is useful only for the growing of trees, and that for such areas proper protection should be arranged as quickly as funds will allow. In so far as those districts having soil suitable for agriculture but now bearing valuable tree growth are concerned, adequate protection should be provided until the lands are disposed of for the purpose best suited so that the timber now upon such lands may eventually be utilized and incidentally turned into revenue.

In the northern district, excepting the area formerly known as the Lesser Slave forest reserve, there is a distinct lack of those improvements or developments so essential to successful forest protection. The only routes of travel are those used by the original inhabitants supplemented by trails opened by surveyors, trappers and settlers. The only communication existing is that which has developed as a result of settlement requirements. There are no trails, roads, telephone or telegraph lines built specially to answer the purposes of forest protection and administration. Fire detection except by the old method of patrol is non-existent and equipment is insufficient. In addition the protective force has remained at practically the same strength for the past twelve or fourteen years, and, in this period, settlement has greatly increased followed by those developments which appear with the settlement of almost any territory. Railways, highways, roads and trails have been built, opening new districts. Land settlement has resulted in many people entering such territory and establishing homes there. Towns and villages have sprung up and settlement at many points is now encroaching on the forest, and is in some cases established on the poorer classes of soil found in the vicinity of many of the forest districts. When it is known that of the total of all fires well over 90% are caused by human beings, it will be realized that the present

protective force and the organization and equipping of areas to be protected from fire is altogether inadequate.

In many sections of the country there is an apparent lack of what might be termed forest consciousness. The individual, in many instances where his operations may have a direct and serious effect on his neighbours, is too prone to consider his actions only as they affect himself. When such reasoning or carelessness is present in dealing with fire, the result is often the loss of private and public property, and occasionally persons are seriously injured or lose their lives.

PERSONNEL ORGANIZATION AND COSTS
(Salaries and wages only)

HEAD OFFICE:

Director of Forestry; Assistant Director of Forestry; Chief Timber Inspector; Timber Investigator \$ 11,525.00

NORTHERN ALBERTA FOREST DISTRICT:

Edmonton Division, 1 timber inspector, 5 seasonal rangers; Bonnyville Division, 1 timber inspector, 2 seasonal rangers; Edson Division, 1 timber inspector, 5 seasonal rangers; Athabaska Division, 1 timber inspector, 5 seasonal rangers; Peace River Division, 1 timber inspector, 6 seasonal rangers; Slave Lake Division, 1 timber inspector, 10 seasonal rangers, 4 lookout men (part-time), 1 telephone operator (part-time); Grande Prairie Division, 1 timber inspector, 7 seasonal rangers; Fort McMurray Division, 1 timber inspector, 8 seasonal rangers 44,872.66

CROWSNEST-BOW RIVER FOREST RESERVE:

1 superintendent, 1 clerk, 1 stenographer, 2 permanent rangers, 13 seasonal rangers, 11 seasonal assistant rangers, 8 lookout men (part-time), 1 patrolman (part-time), 1 telephone operator (part-time)..... 32,521.16

CLEARWATER FOREST RESERVE:

1 superintendent, 1 clerk, 1 permanent ranger, 2 seasonal rangers, 9 seasonal assistant rangers, 2 lookout men (part-time), 1 telephone operator (part-time) 14,836.42

BRAZEAU-ATHABASKA FOREST RESERVE:

1 supervisor, 1 clerk, 1 permanent ranger, 7 seasonal assistant rangers, 4 lookout men (part-time) 23,349.64

CYPRESS HILLS FOREST RESERVE:

1 permanent ranger, 1 part-time labourer 2,085.75

TOTAL..... \$129,190.63

DISTANCE IN MILES TRAVELLED BY FIELD OFFICERS OF THE NORTHERN ALBERTA FOREST DISTRICT AND BRAZEAU-ATHABASKA FOREST

Method of Travel	Miles Travelled	
	Northern Alberta Forest District	Brazeau- Athabaska Forest
Foot	13,332	2,073
Saddle	46,197	16,948
Driving (horses)	18,656	.....
Auto	83,876	595
Speeder	16,044	5,588
Canoe	11,273	.....
Rowboat	602	.....
Motorboat	23,330	.....
Aeroplane	14,922	4,218
Railway .....	.....	.....
TOTALS.....	228,232	29,422

In the Northern Alberta Forest District there were 48 Fire Rangers and 9 Timber Inspectors, a total of 57 men.

In the Brazeau-Athabaska Forest there were 4 Lookout men, 18 Rangers and 1 Supervisor, 23 men in all.

The mileage shown above is for point to point travel only.

**SUMMARY OF WORK DONE BY FIRE RANGERS AND TIMBER INSPECTORS
NORTHERN ALBERTA FOREST DISTRICT**

Improvements, new construction	141 ½	man-days
Improvements, maintenance	482 ¾	"
Nursery	28	"
Fire-fighting	715 ½	"
Fire patrol	5,792 ¼	"
Timber	1,310	"
Fish patrol	1 ½	"
Miscellaneous executive duties	1,155 ¾	"
Care of equipment	551 ½	"
Haying	18 ½	"
Travel	186 ½	"
TOTAL.....	10,333 ¾	"

This is an analysis of the time worked by 48 rangers and 9 timber inspectors. The office work done by the latter contributes largely to the amount of time charged to "miscellaneous executive duties."

FOREST PROTECTION

Forest protection in its broadest sense covers the protection of forests from any destructive agency. In this Province the protective effort is directed towards a reduction of forest losses from fires. Although there is a possibility of losses from other causes, such loss has up to the present been negligible.

Examination of the causes of forest fires over a period of many years clearly points to the fact that human activities are principally responsible for these losses. The percentage of fires caused by such activity fluctuates very slightly from year to year, but a great variation in the number of fires and the extent of forest destruction is noted from year to year. It is apparent that the cause is ever-present, and only requires particular circumstances to produce the effect.

Providing that other influencing factors remain normal, weather, which produces conditions favourable for the ready ignition and quick spread of fire, is responsible more than any other factor for fluctuation in the number of fires occurring annually and for the amount of destruction caused as a result. The weather during the year under review was very favourable for forest protection purposes. Snowfall over the forested territory of the Province varied somewhat. In the southern mountain section it was below normal. Over the northern mountain section and extending over the Northern Alberta forest district, the snowfall was apparently slightly abnormal, the greatest fall being in the late winter and early spring months. There was no spring fire danger period in the mountain section due to these late storms. The situation in this area which makes up the Rocky Mountains forest reserve was reasonably safe until towards the end of July.

In the Northern Alberta forest district the fire situation was satisfactory until May 1st to 10th. The snow had practically all melted by April 25th, and in this district where settlement crowds in on the forest, fire danger followed closely on the disappearing snow. The spring danger period opened later than usual, and as late spring and early summer rains made their appearance at the usual time followed by a good growth of annual plants, this danger period was comparatively short, closing out from June 1st to June 15th.

The fire season was then fairly safe over the Province until towards the end of July excepting that part north of township 90 on the west and north of township 100 on the east. At this time the mountain and foothill section was becoming dry, and this danger period continued until August 10th in the north and to August 22nd in the south.

The fall danger period varied somewhat due to the absence of general precipitation. It may be stated that September and the early part of October constituted a provincial-wide danger period, although in some localities limited relief was provided by rainfall. The fire season closed from October 12th to November 1st, depending on the locality.

The season was very favourable from the standpoint of forest protection. Precipitation was well distributed both over the area and through the season. The result was that the danger periods

were not so lengthy as to allow a fire situation to develop with which the regular field staff could not cope.

Fire Prevention.

In view of the fact that almost all forest fires are caused by human agencies, it follows that preventive efforts must be directed towards the control of those human activities from which fire may originate.

Within the forest reserves such control is exercised, but always with due regard to the freedom and enjoyment of the individual. All forest travellers are required to secure camping or travelling permits which are issued free in order to enjoy such privilege which, in addition to answering requirements of the Service in the matter of control and check, also opens the way for a contact between the traveller and the forest officer concerned which is utilized for providing advice and warning. Registration points suitably equipped for this purpose are also established at convenient points, and are used in conjunction with and supplementary to the free camping and travel permit for the purpose of securing important and necessary information. It is essential that the ranger and his assistants should know who are in the district and where the parties are located. With such information at hand the lookout men can watch areas where destructive fires may start from unextinguished camp fires.

In the more popular camping districts camp grounds are being improved. Debris and underbrush is removed, and in some instances safe fire-places have been provided. This development will gradually have the effect of segregating camping to suitable and safe camp grounds. A further improvement will no doubt be the restriction of open fires to authorized camp grounds. All commercial activities within the reserves are regulated by suitable conditions with regard to the prevention of fire. As a result, such developments have presented a minimum of danger.

Within the fire ranging districts of the Northern Alberta forest district control of human activities is more difficult and the degree of control is not so satisfactory as that obtaining within the forest reserves. This situation is explained by the basic legislation affecting the use of these lands and by the scant field organization. Before satisfactory forest protection can be arrived at it is necessary that the forest area to be protected be placed under control of the protective organization. Reasonable control of campers within the Northern Alberta forest district is not possible under prevailing conditions. One of the greatest menaces to the forest in this district is the uncontrolled settler's fire. Authority for control of burning operations is placed in the hands of the Forest Service, and during the period April 1st to December 1st fires shall only be set under authority of a burning permit. The burning permit will be issued only when conditions for burning are safe, and the necessary fire-guards established with the required assistance and equipment on hand. A more intensive use of the burning permit will undoubtedly be followed by a reduction in the number of destructive fires.

These free permits are issued in the Northern Alberta forest district by the rangers, assisted by officers of the Royal Canadian Mounted Police and by honorary fire guardians appointed for this

purpose. The effort has been to make it possible for settlers to secure the permit with a minimum of trouble, and while the situation in this respect is not all that is desired, it is being improved upon gradually.

The fire permit and the conditions to be fulfilled under its terms is therefore one of the chief preventive measures within the Northern Alberta forest district. With this is linked a ranger patrol through settlements adjacent to forested territory. On these patrols advice regarding clearing fires is given and permits issued.

The construction and operation of railways has always proved to be a source of possible danger to forests. Improvement in this regard has been gradual and satisfactory in the past number of years. The annual burning of right of way debris, the use of good grade coal, the extra width of right of way cleared through hazardous sections within the forest reserves and the use of up-to-date fire prevention appliances have greatly reduced the danger. Forest Service officials under appointment from the Board of Railway Commissioners assist in the control of the fire hazard arising from railway operation. Officials of the Board render valuable assistance, and railway officials and employees co-operate with this Service in a highly satisfactory manner.

PRAIRIE FIRES ACT—STATEMENT OF BURNING PERMITS ISSUED

By fire guardians working within municipal districts, not appointed by the Forest Service	691
By the Royal Canadian Mounted Police	134
By honorary fire guardians appointed by the Forest Service, working in or adjacent to the divisions named:	
Forest Reserves:	
Crownsnest-Bow River	9
Clearwater	5
Sub-total.....	14
Northern Alberta Forest District:	
Edmonton	163
Edson	99
Athabaska	132
Bonnyville	4
McMurray .....	...
Slave Lake	23
Grande Prairie	238
Peace River	50
Sub-Total.....	709
By members of the Alberta Forest Service:	723
Head Office	3
Clearwater	346
Edmonton	148
Edson	276
Athabaska	76
Bonnyville .....	...
McMurray	13
Slave Lake	118
Grande Prairie	155
Peace River .....	...
Total	1,135
GRAND TOTAL	2,683

Fire Detection.

Methods of forest fire detection within this Province vary from the very efficient lookout system established over the major portion of the Rocky Mountains forest reserve and over that area which was known as the Lesser Slave forest reserve to systematic ranger patrol by saddle horse, canoe, power boat, power speeder or on foot. There was no change in or addition to detection services during the year. Some curtailment of these services was arranged in that it was decided to discontinue the employment of extra patrolmen

formerly employed during dangerous periods in many fire ranging districts of the Northern Alberta forest district.

Fire Suppression.

Fire suppression operations were on a more satisfactory footing than in the previous year. While the field staff in the majority of instances showed improvement in directing suppression action, it must be admitted that in many ways the season under discussion was in no way comparable with the fire season of 1931. That an improvement is noted and that further improvement will be made is admitted, but suppression operations will not reach the degree of efficiency so much desired until a very considerable alteration is made in detection services, communication and transportation. An adequate supply of fire-fighting equipment is necessary with this objective in view, together with the employment of a well trained and supervised field staff in sufficient numbers to properly deal with the problem.

During the year the Forest Service dealt with 379 fires, which burnt over 136,117.89 acres. Of this area 68,253.42 acres were non-forested land. The total loss of timber, both merchantable and young growth, was estimated at \$160,151.31. Cost of suppression was \$15,653.46 for outside services, supplies, etc., with cost of ranger service \$3,158.09, making a total of \$18,811.55. There were no fires in the Cypress Hills forest reserve. Of the total number in the Province, 153 were designed class A, burning less than one-quarter of an acre. This is a fairly clear indication of the value of ranger services. Everyone of these small fires discovered and extinguished represented an incalculable saving in forest resources and suppression costs. The total of small fires as represented by classes A and B (the latter over one-quarter of an acre and under ten acres) was 244, and the ratio of small fires to large fires, the latter as represented by classes C and D and totalling 135, is reasonably satisfactory as compared with 1931 operations. From the point of view of forest protection the situation is not satisfactory, but cannot be greatly remedied until funds for organization, improvements and equipment are made available.

Fire Causes.

SUMMARY OF FOREST FIRE LOSSES BY CAUSES WITHIN AND OUTSIDE ALBERTA FOREST RESERVES—CALENDAR YEAR 1932

Cause	No.	Per Cent.	Cost of Suppression	Area (in acres)	Salvable Timber M-F.B.M.	Salvable Timber Cords	Unsalvable Timber M-F.B.M.	Unsalvable Timber Cords	Total Loss
Campers	200	52.78	\$10,130.11	51,550.11	28.75	10,260.00	28,922.70	76,526.00	\$ 89,098.63
Smokers	20	5.28	265.67	2,522.00	75.00	50.00	2.00	352.00	257.75
Settlers	65	17.15	1,485.78	41,346.00	115.00	1,635.00	3,042.25	7,370.00	10,752.00
Railways	17	4.48	41.28	276.25	...	...	...	...	26.25
Lightning	10	2.64	380.07	1,704.75	30.00	35.00	3,877.20	15.00	4,178.88
Industrial operations	4	1.05	22.02	16.50	...	2.00	...	...	4.75
Incendiary	31	8.18	3,775.03	6,610.85	23.00	13,401.00	2.00	3,215.50	10,896.80
Public works	2	.53	18.21	3.25	...	15.00	720.00	40.00	25.50
Unclassified	6	1.58	89.97	960.60	...	...	...	...	3,240.00
Unknown	24	6.33	2,603.41	31,127.50	11.00	2,680.00	7,904.00	46,230.00	42,396.25
TOTALS.....	379	.....	\$18,811.55	136,117.89	282.75	28,078.00	44,472.15	133,748.60	\$160,876.31

SUMMARY OF FOREST FIRE LOSSES WITHIN ALBERTA FOREST RESERVES—CALENDAR YEAR 1932

Campers	9	28.12	\$1,831.94	1,001.30	.....	10,000.00	1.00	.....	\$8,757.75
Smokers	3	9.37	3.62	2.50	.....	.....	2.00	.....	2.00
Settlers .....	...	.....	.....	.....	.....	.....	.....	.....	.....
Railways	6	18.75	11.48	.75	.....	.....	.....	.....	.....
Lightning	7	21.87	236.86	1,292.75	.....	.....	3,840.00	.....	3,849.93
Industrial operations	1	3.13	1,407.14	257.35	.....	2.00	.....	.....	4.75
Incendiary	5	15.63	1,407.14	257.35	8.00	5,861.00	2.00	1,005.60	1,176.30
Public works .....	...	.....	.....	.....	.....	.....	.....	.....	.....
Unclassified	1	3.13	.....	.10	.....	.....	.....	.....	.....
Unknown .....	...	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS.....	32	.....	\$3,491.04	2,555.75	8.00	15,863.00	3,845.00	1,005.60	\$8,790.73

SUMMARY OF FOREST FIRE LOSSES WITHIN THE NORTHERN ALBERTA FOREST DISTRICT—CALENDAR YEAR 1932

Campers	190	55.55	\$8,271.25	50,548.82	28.75	260.00	28,921.70	76,526.00	\$85,340.88
Smokers	17	4.97	262.05	2,519.50	75.00	50.00	.....	352.00	255.75
Settlers	65	18.01	1,485.78	41,346.00	115.00	1,635.00	3,042.25	7,370.00	10,752.00
Railways	11	3.22	28.50	275.50	.....	.....	.....	.....	26.25
Lightning	1	.29	40.00	40.00	.....	.....	.....	.....	250.00
Industrial operations	3	.88	22.02	15.50	.....	.....	.....	.....	.....
Incendary	25	7.31	2,367.89	6,088.50	15.00	7,540.00	.....	2,210.00	9,720.50
Public works	2	.58	18.21	3.25	.....	.....	2.00	40.00	25.50
Unclassified	4	1.17	89.97	960.5	.....	15.00	790.00	.....	3,240.00
Unknown	24	7.02	2,603.41	31,121.50	11.00	2,680.00	7,904.00	46,230.00	42,396.25
TOTALS.....	342	100.00	\$15,192.89	133,285.07	244.75	12,180.00	40,589.95	132,728.00	\$152,007.13

SUMMARY OF FOREST FIRE LOSSES OUTSIDE ALBERTA FOREST RESERVES—CALENDAR YEAR 1932
(Includes fires within the Northern Alberta Forest District and those outside forest reserves acted upon by officers of the Forest Service)

Campers	191	55.04	\$ 8,298.17	50,548.89	28.75	260.00	28,921.70	76,526.00	\$ 85,340.88
Smokers	17	4.90	262.05	2,519.50	75.00	50.00	.....	352.00	255.75
Settlers	65	18.74	1,485.78	41,346.00	115.00	1,635.00	3,042.25	7,370.00	10,752.00
Railways	11	3.17	29.80	275.50	.....	.....	.....	.....	26.25
Lightning	3	.86	143.21	412.00	30.00	35.00	37.20	15.00	328.45
Industrial operations	26	7.49	2,367.89	6,353.50	15.00	7,540.00	.....	2,210.00	9,720.50
Incendary	2	7.58	18.21	3.25	.....	.....	2.00	40.00	25.50
Public works	5	1.43	89.97	960.50	.....	15.00	720.00	.....	3,240.00
Unclassified	24	6.92	2,603.41	31,127.50	11.00	2,680.00	7,904.00	46,230.00	42,396.25
TOTALS.....	347	100.00	\$15,320.51	133,562.14	274.75	12,215.00	40,627.15	132,743.00	\$152,085.58

It will be noted that the two principal causes of fires during the year were campers and settlers. The movement of persons seeking employment has resulted in a considerable increase in conflagrations originating from unextinguished camp fires. Many of these persons are poorly equipped for camping purposes, and furthermore have had little experience in camping. It is also probable that a great many do not realize the importance of being careful with fire, or it may be that they realize this, but are just careless. This class of traveller does not account for all unextinguished camp fires. It is a curious fact that many regular and experienced campers who apparently enjoy camping are notoriously careless in this respect. The majority of travel occurs along the better trails, roads, highways, waterways and to a very considerable extent along railways. Under such circumstances regular patrols pick up the majority of these fires before they become so large that they are expensive and difficult to handle. It will be noted that of 200 fires originating from camp fires, 108 were extinguished before exceeding one-quarter of an acre and 35 before exceeding ten acres in size. It is not difficult to visualize the results which would obtain through a reduction or an increase in patrol intensity.

Fires originating from settlers' operations comprised 17.15% of the total, which was a considerable improvement on the 1931 situation. These 65 fires burnt over 41,346 acres as compared with 200 fires from campers burning over 51,550.19 acres. While an improvement over the showing of 1931 was readily apparent and may be explained to some extent by more strict enforcement of fire regulations, the important point is that over half of these fires were large ones. The difference between campers' and settlers' fires is that the camp fire, if left unextinguished, is small in size whilst the settler's clearing fire is usually quite large, and when this class of fire gets out of control it is difficult to deal with.

Fires of incendiary origin are next in importance in respect to percentage of the total number. The average loss caused by these 31 fires was in excess of the average loss caused by the 65 settlers' fires reported, but the damage to timber was only a little over 6% of the total fire damage.

Fires of unknown origin represented 6.33% of the total. Of these 24 fires, 13 were of classes A and B, or small in size. The remaining 11 were large, and burned over almost 42,396.25 acres, causing damage estimated at \$31,127.50.

These were the four most important causes of fires during the year. While such causes are not completely controllable, it is possible by a more intensive organization to obtain much greater check over campers' and settlers' fires, and no doubt such control would be favourably reflected by a reduction in the number of and loss from fires of incendiary and unknown origin. These four causes accounted for 320 of the 379 fires, and burned over 130,634.54 acres of the total acreage of 136,117.89, causing an estimated damage of \$153,143.68 of the total fire damage of \$160,876.31. The suppression costs, including ranger services, were \$17,994.33 of a total suppression cost for fires of all classes inclusive of ranger services of \$18,811.55.

Smokers caused 5.28% of all fires. While in the matter of number, area burnt over, damage and cost of suppression the situation

in respect to fires from this cause shows some improvement, it does not reflect any credit on the people responsible.

Railway fires to the number of 17 represent 4.49% of the total, and are an important item. Of these fires, 16 were small ones of classes A and B, the other being class C. Here is an example of the result of well-directed prevention effort and an indication of the value of immediate reports followed by quick suppression action. Railway fires, once very numerous and among the most destructive, are now among the least troublesome of the protection problem. This comes about through the work of officials of the Board of Railway Commissioners, assisted by officers of the Forest Service and through the efforts of railway officials and employees. A degree of co-operation exists between all concerned which is very satisfactory indeed.

RAILWAY FIRE LOSSES WITHIN THE PROVINCE OF ALBERTA
CALENDAR YEAR 1932

(Includes only fires in railway patrol territory)

NOTE.—Railway fires are fires originating or burning to within 300 feet of the centre line of the right of way of a railway. Railway fires occurring in forested areas under the supervision of the Alberta Forest Service are summarized here.

	Northern Alberta Railways	Canadian National Railways	Canadian Pacific Railway	Totals
CAUSES AND NUMBER OF FIRES:				
Locomotives	2	6	.....	8
Railway employees	5	2	.....	7
Campers and travellers	25	.....	.....	25
Settlers	17	.....	.....	17
Unclassified	2	1	.....	3
Unknown	1	.....	.....	1
Totals.....	52	9	.....	61
NUMBER OF ACRES BURNED:				
Merchantable timber	2,143	.....	.....	2,143
Slashing or old burn	13	7.5	.....	20.5
Young growth	79	170	.....	249
Not forested	309	80.75	.....	389.75
Totals.....	2,544	258.25	.....	2,802.25
LOSS:				
Timber	\$1,001.00	.....	.....	\$1,001.00
Young growth	472.00	\$68.75	.....	540.75
Other property	4.00	.....	.....	4.00
Totals.....	\$1,477.00	\$68.75	.....	\$1,545.75

NATURE OF FOREST FIRE LOSSES WITHIN AND OUTSIDE FOREST RESERVES OF ALBERTA—CALENDAR YEAR 1932
 Note: Class A fires are 0 to $\frac{1}{4}$ acre; Class B, $\frac{1}{4}$ to 10 acres; Class C, 10 to 500 acres; Class D, over 500 acres.

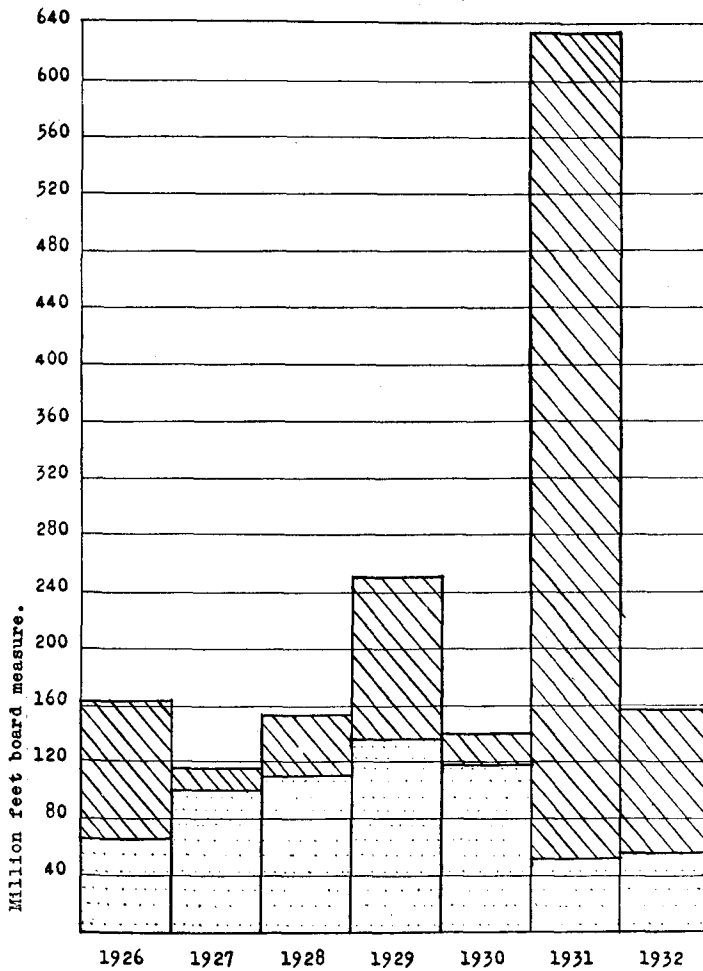
Forest or District	No.	Per Cent.	Sizes of Fires				Ownership (area in acres)			Nature of Loss			
			A	B	C	D	Public	Private	Total	Merchant- able Timber- land	Cut-over Timber- land	Young Growth	Not Forested
Cypress Hills Forest	11	2.90	3	6	1	1	1,254.15	3.25	1,257.40	1,029.80	59.10	84.85	83.65
Crownest-Bow River Forest	5	1.32	3	.....	2	.....	275.00	275.00	1,275.00	100.00	25.00	150.00	.....
Clearwater Forest	21	5.64	14	6	.....	1	1,300.42	7.73	1,300.42	1,282.55	7.73	7.32	2.82
Brazeau-Athabaska Forest	342	90.24	133	79	88	42	98,779.57	34,505.50	133,285.07	31,004.87	6,705.00	27,408.25	68,166.95
Northern Alberta Forest District													
TOTALS	379	100.00	153	91	91	44	101,334.14	34,783.75	136,117.89	33,417.22	6,796.83	27,650.42	68,253.42
Percentages .....		.....	40.37	24.01	24.01	11.61	74.44	25.56	100.00	24.56	4.99	20.31	50.14

SUMMARY OF FOREST FIRE LOSSES WITHIN AND OUTSIDE ALBERTA FOREST RESERVES—CALENDAR YEAR 1932

Forest or District	No.	Per Cent.	Cost of Suppression	Area (in acres)	Salvage Timber M-F.B.M.	Salvage Timber Cords	Unsalvage Timber M-F.B.M.	Unsalvage Timber Cords	Total Loss
Cypress Hills	11	2.90	\$ 3,142.87	1,257.40	8.00	15,863.00	2.00	929.60	\$ 4,879.98
Crownest-Bow River	5	1.32	81.46	275.00	30.00	35.00	30.00	13.00	71.25
Clearwater	21	5.54	894.33	1,300.42	.....	.....	3,860.20	76.00	3,917.95
Brazeau-Alberta	342	90.24	15,192.89	133,285.07	244.75	12,180.00	40,589.95	132,728.00	152,007.13
Northern Alberta Forest District									
TOTALS	379	.....	\$18,811.55	136,117.89	282.75	28,078.00	44,472.15	133,748.60	\$160,876.31

GRAPH OF TIMBER DEPLETION, PROVINCE OF ALBERTA

CALENDAR YEARS 1926 to 1932, inclusive



During this period, the total depletion was 1,609,144,780 F.B.M.
 of which 39.43% was utilized and 60.57% lost by fire.

Legend:  Timber Lost by fire
 Timber utilized

Personnel.

All the personnel of the Forest Service excepting some of the head office staff engaged on timber administration are responsible for some phase of forest protection work. Protection is the most important duty of the field staff and the various phases of this work engage more of their time than any other problem.

Territory coverage by field staff remained at practically the same intensity as in previous years excepting that patrolmen were not provided to assist various rangers in the Northern Alberta forest district. While coverage has remained the same for a considerable period of years, various hazards have increased tremendously during this time. Staff strength on the forest reserves is fairly satisfactory, but the field staff as employed in the Northern Alberta forest district is below requirements.

Fire-Fighting Equipment.

The supply of equipment specially for the purpose of fire-fighting is a matter of some concern. Practically all such material on hand today came into the possession of this Service through transfer from the Federal Forest Service. While almost all of this equipment was in good condition at the time of transfer, some of the pump units were obsolete and practically useless. Two fire seasons have passed since this material was transferred to the provincial service, one of which was a very busy one and the other sub-normal from the point of view of fire-fighting. During this period a considerable amount of equipment has been worn out, lost or destroyed, and has therefore been written off the records. Full replacement of this write-off has not been made. There is a real need of further pumping units, hose, water pack bags and pumps, canvas in the form of tents and tarpaulins and various hand tools.

Equipment is being stored and maintained in a satisfactory way. Storage facilities are fairly satisfactory in most divisions, and are adequate for present supplies. Distribution under the circumstances is reasonably good.

Co-operation.

One of the most satisfactory co-operative arrangements is that which exists between this Service, the Board of Railway Commissioners and the railways. The results secured here are evident on examination of the fire statistics. A comparison with the conditions obtaining a number of years ago will show that the situation in respect to railways has improved to such an extent that railway operation is no longer one of the principal fire hazards.

A co-operative arrangement is also in effect between the Dominion Parks Branch and this Service. The results are highly satisfactory and, it is believed, have been mutually beneficial.

Valuable help has also been received from the Royal Canadian Mounted Police, particularly in the matter of issuing burning permits. Co-operation is mutual with other government departments, and is of considerable benefit to all concerned, but particularly to the Fisheries Division and the Game Branch. The Service is also indebted to many fish and game associations for

support and for active assistance and to many individuals, not in any way connected with the Service, for help in different directions.

The group of public-spirited men who have accepted appointments as honorary fire guardians in order to further the work of fire protection, and also in order that their neighbours may secure permission to burn for land clearing purposes without undue delay and with a minimum of trouble, have been of great assistance to the Service. It is hoped that further appointments will be made to the end that control of settlers' fires will be placed on such a basis that forest fire hazard from settlement of land will be greatly reduced.

IMPROVEMENTS

The term improvements covers such projects as roads, trails, telephone lines, buildings and miscellaneous items constructed with a view to organizing and bettering the protective and administrative effort.

Within the forest reserves and that area previously known as the Lesser Slave forest reserve many improvements were constructed. The major portion of those required for these areas is completed excepting a portion of the former Lesser Slave forest reserve. Since the transfer of the resources new construction work has been practically at a standstill, but maintenance has been dealt with in a reasonably satisfactory manner by the regular staff. The large reduction in the permanent ranger staff and the period of employment of seasonal men will no doubt be reflected in the condition of certain improvements. It is known that telephone lines during the past winter became unusable over large sections and that buildings, especially houses, cabins and barns at vacated stations suffered to some extent.

The principal new projects were dealt with by unemployment relief camps. These were located within the Crowsnest-Bow River forest, being the Red Deer road and the buildings required for the Red Deer ranger station unit, and within the Clearwater forest in the construction of the new road from Nordegg west up the North Saskatchewan river valley.

The weather obtaining last winter was not particularly favourable for road work at the higher altitudes, but on all the projects quite satisfactory results were obtained. The reports of the officials directly concerned with these improvements deal with the work involved and the progress made.

EXISTING IMPROVEMENTS USED BY THE ALBERTA FOREST SERVICE

NOTE: All improvements listed within the forest reserves have been constructed by the Forest Service. Most of the improvements shown in the Northern Alberta Forest District are on the former Lesser Slave Forest Reserve, and were built by this organization. The Northern Alberta Forest District rangers use and maintain many miles of trail which they did not construct, and which are not listed.

Forest or District	Shops, Caches and Sheds	Trails (miles)			Roads (miles)	Telephone Lines (miles)	Cabins	Lookout Towers and Cabins	Ranger Station Houses	Stables	Corrals
		Primary	Secondary	Auxiliary							
Cypress Hills	5	.....	.....	.....	31.12	13.00	1	...	1	2	1
Crownest-Bow River	34	670.50	388.50	211.00	275.80	473.85	40	8	17	27	20
Clearwater	9	664.75	155.50	25	50.00	183.00	26	3	3	4	4
Brazeau-Athabasca	19	365.50	316.80	57.50	37.75	206.80	32	4	7	9	11
Northern Alberta Forest District	15	416.62	444.50	366.12	.....	108.75	29	8	3	4	...
TOTALS	82	2,117.37	1,305.30	634.87	394.67	985.40	128	23	31	46	36

Forest or District	Fences (miles)	Summer Resorts	Water Supply Systems	Fire- guards (length in yds.)	Bridges	Bunk- houses	Ferries	Gateways	Granaries	Offices	Dams
Cypress Hills	6.00	1	2	7,920	...	...	...	...	...	...	1
Crownest-Bow River	59.00	...	12	.....	8	3	...	4	1	...	...
Clearwater	15.75	...	3	.....	1	1	1	2	...	...	...
Brazeau-Athabasca	19.00	...	4	25,198	2	1	...	...	...	1	...
Northern Alberta Forest District	14.00	...	2	.....	...	...	...	...	...	1	...
TOTALS	113.75	1	23	33,118	11	5	1	6	1	2	1

EQUIPMENT

In view of the existing conditions of financial stringency, the purchase of equipment either as an addition to that already on charge or as a replacement was purposely kept low. In order that the travel of inspectors be placed on a uniform and economical basis, low-priced motor cars of a popular make were purchased, one for each division requiring them and one for the Chief Timber Inspector. Seven motor cars were purchased.

The patrol boat operated on the Peace River was replaced by one of better design and construction. The old boat was very unsatisfactory, the hull, in addition to other defects, being unsafe due to ice damage caused on a late patrol. Boats are not the best means of patrol, and on the Peace River travel and transportation by boat is not as extensive as it once was. Until better means are provided, however, the boat patrol should be maintained.

One new fire-fighting engine was added to the equipment, and 10,000 feet of special forestry linen hose was purchased. A considerable number of engines now on charge are obsolete, and should be replaced by up-to-date pumping units as soon as possible. The hose was purchased partly as a complement to the new pumping unit and partly for the replacement of hose which was worn or damaged in fire-fighting.

The forest reserves are fairly well provided with fire-fighting equipment, but more is needed, and obsolete equipment should be replaced. The distribution here is quite good and storage and maintenance are satisfactory.

A reverse situation exists in the Northern Alberta forest district, where there is a very real lack of all kinds of equipment. The facilities for storage at present are only at division headquarters, so that distribution cannot be satisfactorily arranged and maintenance in many instances cannot be kept in hand. This situation exists in all the divisions of the Northern Alberta forest district excepting Lesser Slave, part of which was previously operated as forest reserve. In the Wabasca subdivision of Lesser Slave, however, there also exists a lack of equipment.

SILVICULTURE

Utilization of Forest Resources.

The changing of raw forest resources into manufactured material suitable for a variety of uses is a matter of vital interest to the Forest Service. Of primary interest is the initial operation connected with this manufacture, though if payment of timber dues is based on the sawn material when sold, it is then necessary to exercise a degree of control to that point. Beyond this, control is unnecessary, but interest in manufacturing processes and in the final products developed is essential in order that markets affecting the sale of such products and which, therefore, in turn affect the sale of the raw material by the Department, may be known and if possible extended.

In view of the fact that forests are a replaceable resource, it is essential that operations, having in view the taking of merchantable timber, should be governed by procedure that will influence

the natural restocking of cut-over areas and, as such merchantable timber is a source of revenue, it is equally important that the interests of the Department should be protected. Regulations designed to control timber operations in the interest of forest management and to protect the welfare of the Department have been developed over a period of years, and these are amended or changed from time to time when it is found that such changes are required by the industry, the settler or by the Department. Thus it is found that during the past year certain amendments were placed in the regulations with a view to encouraging the salvage of timber destroyed by fire.

The regulations governing the disposal of timber within forest reserves as compared with those covering such disposal in outside areas are somewhat dissimilar. This matter is under review, and it is hoped that a similarity of all timber regulations for the Province will be effected shortly. Uniformity viewed from any angle would be highly desirable in its provision for effective administration, and in its creation of a better understanding by those connected with the timber industry.

Timber Operations.

Again, as in the two preceding years, timber operations were carried on much below the normal rate of activity. Market conditions for forest products continued to be discouraging, with the result that many of the larger operators greatly curtailed or temporarily discontinued activity. A considerable number of small operations were in force, applicants for timber permits being fairly numerous, with the result that many inspections were required.

The change in organization whereby timber inspectors, in addition to the field administration of timber operations, became responsible for forest protection within defined areas provided for contact with all phases of forestry field work and thus produced better results than it has been possible to obtain heretofore. The change has made it possible to broaden the use and responsibility of the rangers in the Northern Alberta forest district in that they can be of assistance to the inspectors on certain classes of timber inspection duties.

In addition to the work already outlined, the inspectors are given other departmental assignments not directly connected with the Forest Service such as hay permits, homestead inspection and other duties which might be transacted without too greatly interfering with their regular work.

STATEMENT OF TIMBER OPERATIONS ON PROVINCIAL AND SCHOOL LANDS
APRIL 1st, 1932, TO MARCH 31st, 1933

	Licensed Timber Berths	Permit Timber Berths	Provincial Lands Timber Permits	School Lands Timber Permits
Number of active operations	41	115	2,406	130
Lumber—f.b.m.	38,181,881	7,471,163	6,944,719	138,704
Railway ties	23,029	166,151	77,068	500
Piling—lineal feet ....	.....	560	20,355	752
Mine timber—lineal feet	34,952	102,512	158,699	.....
Lath	3,880,405	82,200	.....	.....
Telegraph and telephone poles....	.....	.....	8,760	.....
Building logs—lineal feet ....	.....	.....	705,839	12,656
Fence rails ....	.....	.....	1,004,129	1,000
Roof poles ....	.....	.....	242,832	2,003
Fence posts ....	.....	.....	303,207	4,380
Cordwood—cords ....	.....	.....	6,213	808
Shingle bolts ....	.....	.....	10,000	.....

Number of Inspection Reports submitted by Timber Inspectors..... 1,476
Number of Timber Seizures made 145

ANALYSIS OF WOOD SALES ON FOREST RESERVES—FISCAL YEAR 1932-33

Fuelwood (cords)	4,267
Fence-posts, rails, and piling (pieces)	25,049
Fence-posts, rails and piling (lin. ft.)	4,778
Saw timber (F.B.M.)	375,568
Mining timber (lin. ft.)	967,220
Lagging (cords)	147
Building logs (pieces)	1,586
Building logs (lin. ft.)	216,825
Telephone and telegraph poles	2,825
Fence droppers (pieces)	4,723
Christmas trees	24

TIMBER CUT FROM TIMBER SALES—PERIOD APRIL 1st, 1932, TO MARCH 31st, 1933
(There were 11 active, 13 inactive and 2 new sales during this period.)

	Saw-logs Fire-killed F.B.M.	Saw-logs Green F.B.M.	Mining Timber Green Lin. ft.	Mining Timber Fire-killed Lin. ft.	Lagging Lin. ft.	Green Tops Pes.	Mine Ties	Value
Brazeau-Athabaska .....	.....	501,846	241,848	137,324	.....	.....	672	\$2,861.70
Clearwater .....	.....	74,797	.....	216,574	59,273	.....	.....	1,451.01
Crowsnest-Bow River	5,752	1,790,384	2,400	780	.....	3,770	330	4,686.25
TOTALS.....	5,752	2,367,027	244,248	354,678	59,273	3,770	1,002	\$8,998.96

Nursery.

For the purpose of supplementing the work of the federal Department of Agriculture through their nurseries at Indian Head and Sutherland, Saskatchewan, and therefore speeding up the work of prairie tree planting by farmers and also for the purpose of producing tree stock for reforestation projects, a forestry nursery has been established at the Oliver Mental Institute, northeast of the city of Edmonton.

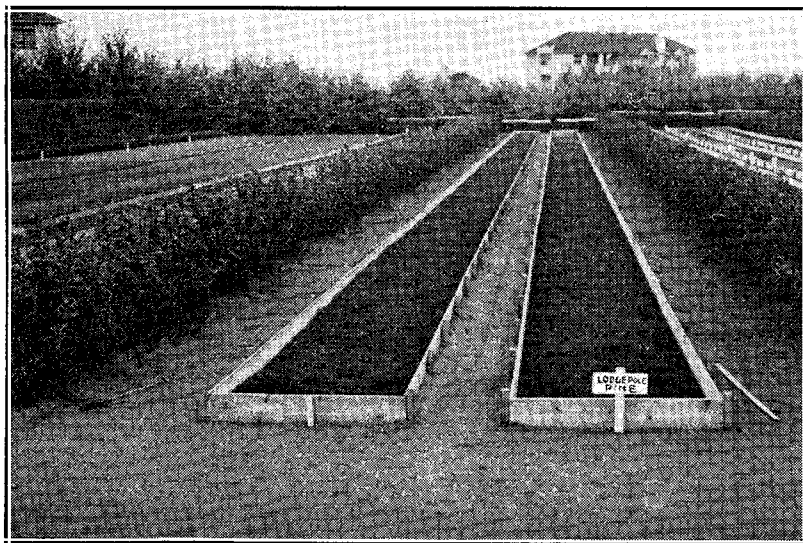
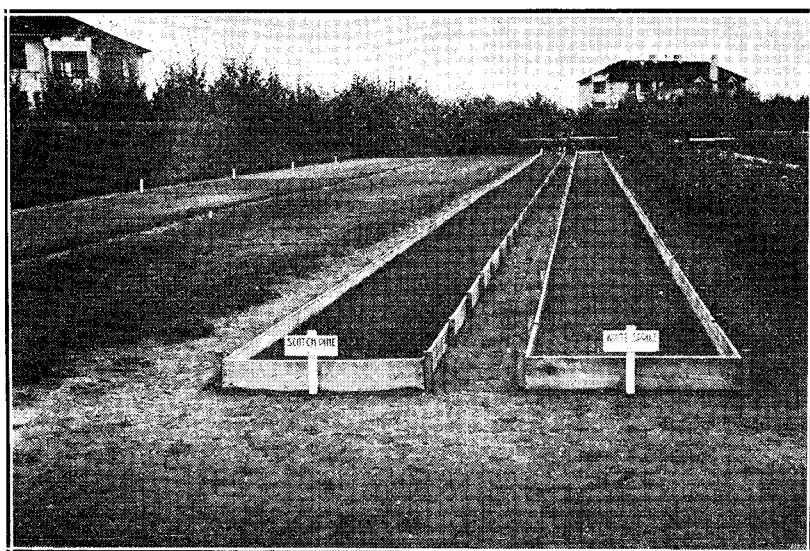
The value of systematic planting of certain shrubs and trees for shelter belts, shelter bluffs and beautification, for the purpose of conserving moisture, reduction of soil drifting and for the beautifying of homes, has been conceded by practically everyone. It is believed that adequate planting of suitable tree stock is the solution of some of the problems faced by the prairie farmer and the partial solution of others. It is hoped, therefore, that by supplementing the supply available from the federal nurseries that greater headway will be made in obtaining the desired results.

There are, in the Province, certain tree species which are only valuable, beyond shelter belt purposes, for fuelwood, and it is intended that a number of more valuable species should be introduced and experiments carried on at the nursery with a view to proving or disproving the adaptability of such species to the conditions found in this Province. Amongst the different varieties of trees which have been planted at the nursery during the past year for experimental purposes are the following: Douglas fir, western cedar, Siberian larch, elm, ash, burr oak, horse chestnut and a hardy variety of plums.



Siberian Larch grown at the Oliver Forest Nursery

It is not the intention of the Forest Service to make a distribution of seedlings of these exotic species at the present time. Experiments will tell whether they are suitable for growing in this Province. In the meantime the distribution of stock will be confined to caragana and native coniferous species such as lodgepole pine, jack pine and white spruce. There is, however, one exotic type which has been grown successfully in this country, and that is Scotch pine, and it is the intention of the Service to use this for distribution purposes. Owing to the very poor seed crop of native species last year, a quantity of scotch pine seed has been purchased



Seedlings in seed beds at the Oliver Forest Nursery

for seeding in beds this spring for future distribution. This type in its native element in Europe and Asia is one of the principal producers of lumber, and is a very fine looking tree.

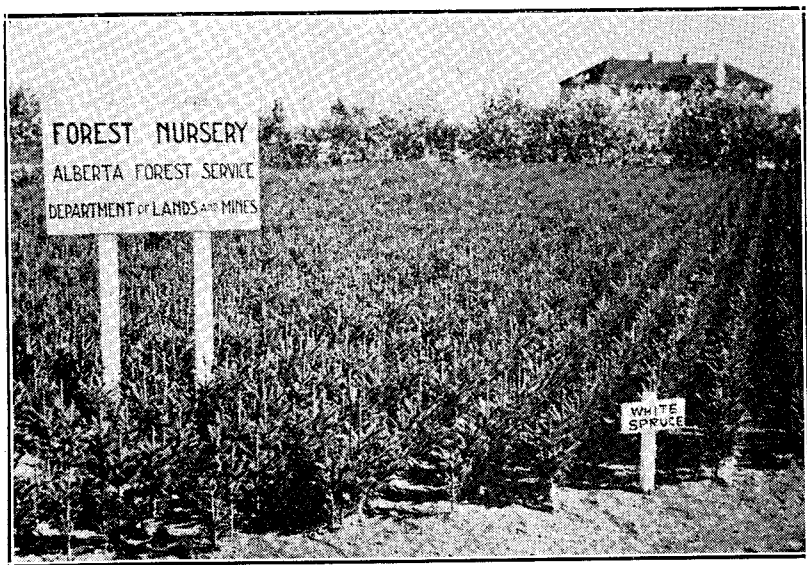
There are, in parts of the Province, areas of land suitable only for the growth of trees and which at the present time are more or less barren of any growth. There are also important watershed areas on which tree growth is not at all satisfactory, due principally to a succession of forest fires. When funds are procurable for the extension of the nursery project on a much larger scale, it is intended that stock shall be available for the planting of such areas. Certain parts of the central eastern part of the Province, which have in times past supported a tree growth, are now devoid of such growth, and it is the intention of the Service to experiment with certain drought-resisting species in order that one may be found which will grow satisfactorily on these areas. Planting of this nature, it is hoped, will tend to conserve moisture in these districts, and will at the same time create a supply of wood for farmers in areas where this commodity has become scarce.

The establishment of a forest nursery and the production of tree stock on a sufficiently large scale to be of value requires a considerable expenditure and a good deal of time. The preparation of seed and transplant beds, the collection and extraction of seed, the seeding, transplanting, care, and development of the plant to a stage of growth suitable for distribution and final planting takes from three to five or six years.

At the Oliver Mental Institute preparation for a successful forest nursery has been in hand since the fall of 1931. At that time a large amount of spruce and pine stock, developed to the transplanting stage, was available at the Cooking Lake forest reserve, east of Edmonton. This stock was moved to the nursery in the spring of 1932. Approximately 4,550 four year old jack pine, 3,900 four year old lodgepole pine, 2,700 four year old larch and 59,620 four year old white spruce were planted in rows sixteen inches apart and spaced every three inches. The balance of the stock comprising about 175,000 two year old white spruce was planted very close together in rows one foot apart for future transplanting. About half of this stock will be available for distribution in the spring of 1934 while a small quantity will be available for distribution this spring.

In addition to the seedlings already available from the Cooking Lake reserve, two large seed beds 165'x4' were prepared in the spring of 1932 and seeded to lodgepole pine, jack pine and spruce. Added to these, a smaller bed was established in which species, exotic to the Province, were planted. It is conservatively estimated that this operation is represented by the growth of approximately 500,000 lodgepole pine, 6,000 jack pine and about 5,000 white spruce seedlings together with an undetermined small number of each of the exotic species planted. This stock is to be moved to transplant beds during the fall of 1933, in which they will remain from two to three years before they will be available for distribution.

The provincial Department of Agriculture was responsible for the initial work in connection with the production of a large quantity of caragana plants. When it was anticipated in 1931 that the Federal Government nurseries would be done away with, a



Spruce transplants at the Oliver Forest Nursery

considerable amount of caragana seed was collected with a view to supplying large quantities of seedlings and seed to the farmers to make up for the loss of supplies of other species until such time as the provincial governments could establish their own nurseries. Under the direction of the Forest Service, machinery for the distribution of caragana, planted at the Oliver Mental Institute, was set up and applications were dealt with. The number received from individuals, institutions and schools amounted to 1,010 of which it was necessary to refuse 111, the reasons in most cases being the late arrival of the applicants' requests. The approval of these applications represents the packing and shipping of approximately 700,000 caragana plants, 8,000 white spruce seedlings and 400 lodgepole pine seedlings, which was all the stock available for distribution for the spring of 1933.

GRAZING

The administration of grazing resources within the forest reserves is a responsibility of the Forest Service. The work in connection with this is almost wholly centered within the two southern divisions of the Rocky Mountains forest reserve—the Crowsnest and Bow River, and in the Cypress Hills forest reserve in the south-eastern part of the Province.

The areas mentioned furnish a large amount of summer grazing for the herds of stockmen in the vicinity, and as a matter of fact the great majority using forest range is largely dependent on this range for summer pasture. From the viewpoint of the Forest Service the utilization of this grazing resource is of twofold importance, firstly, by the elimination of a hazardous condition through the removal of range grasses and to a limited extent of other annual plants which if left to dry and cure would be a fire trap, and, secondly, the regulated use of this annually replaced resource with a view to sustained revenue and for the benefit of the stock raising industry.

Under these circumstances it is important that the grazing of livestock be regulated in the interests of all concerned. Distribution of stock should provide for uniform utilization of range fodder to the greatest extent possible in consideration of the number of stock being grazed. Overgrazing either through permitting more stock on the range than can be safely grazed or through the poor distribution of stock must be avoided.

The grazing situation during the year was very satisfactory. A considerable area was used to capacity and south of the Crowsnest Pass a local demand for sheep range developed. The territory north of the Bow River valley will support a large number of livestock, but most of the range is at present partially or wholly unutilized. Under prevailing conditions in the stock-raising industry there is no incentive to use this range.

GRAZING REPORT—GRAZING YEAR 1932

Forest	No. of permits	No. of cattle	No. of horses	No. of sheep
Cypress Hills	72	2,510	412	.....
Crowsnest-Bow River	302	16,759	2,073	7,465
Clearwater	78	41	286	.....
Brazeau-Athabaska	113	103	549	.....
Cooking Lake	41	673	57	.....
TOTALS.....	606	20,086	3,377	7,465

REVENUE FROM FOREST RESERVES

Revenue for the year ending March 31, 1933 shows a decrease of \$10,766.53 from the year previous. This is partly accounted for by the fact that the Lesser Slave provincial forest was discontinued, the revenue formerly derived from this source now being credited to the Edmonton and Peace River land agencies.

There was a decrease of \$3,343.10 shown in timber permits and seizures.

Collection of timber sale dues showed a decrease of \$4,959.38 over the previous year. Approximately half of this decrease is accounted for by the fact that for part of the year 1932-33 revenue derived from timber sales on the former Lesser Slave forest was not credited to forest reserve revenue. It might also be pointed out that some timber sales which were active and revenue producing during 1931-32 were not operated during 1932-33.

Hay permits, never a large source of revenue on provincial forests, show a decline of \$56.25.

Fishing permits also show a decrease of \$254.75.

Miscellaneous use permits show a small decline.

Sundry revenue shows a decline of \$1,901.55, which is accounted for by the fact that the collection of house rent was discontinued on provincial forests with four exceptions.

Grazing revenue shows an increase of \$1,704.11 and surface rentals show an increase of \$158.07.

The following is a summary of revenue received from all sources on provincial forests:

Timber permits	\$ 6,096.73
Timber seizures	23.80
Timber sales	9,748.78
Grazing permits	12,098.99
Hay permits	208.00
Fishing permits	1,087.50
Surface rentals	1,971.28
Miscellaneous use permits	805.90
Sundry revenue	721.35
TOTAL.....	<u>\$32,762.33</u>

RECREATION

Every year an increased use of forested territory for recreation is noted, new or improved roads providing safer and surer travel and the publicity given to certain popular districts has been followed by a growing influx of campers, picnickers, fishermen and hunters.

In the southern part of the Province where reasonably good roads and trails exist between nearby villages, towns and cities to the forest reserves and where lands are occupied up to the forest reserve boundary the use is one of long standing. The privilege of using such areas for recreational purposes is an important one to many people of this Province. Indeed the people of the Province are fortunate in that recreational areas of great appeal exist so convenient to them.

The northern divisions of the Rocky Mountains forest reserve are not yet accessible to the motoring public. They are, however, important recreational areas for the residents of the coal-mining towns situate within their boundaries and are very popular with the big game hunter.

Recreational use of forested territory carried with it a distinct danger to the forest. This danger can be to a large extent directly controlled, and it can be further minimized by arousing in the public a thorough understanding of the importance of forests. In view of the benefits derived from such use it should receive encouragement particularly in those areas where a satisfactory degree of control is possible.

PUBLICITY

Exhibits of general interest were placed in the Stampede ranger station cabin on the occasion of the Calgary exhibition and likewise at the Forest Service cabin at the time of the Edmonton exhibition. Good attendance is again reported.

A small amount of publicity dealing particularly with fire danger appeared from time to time in the daily and weekly papers. Such articles meet the immediate need of an emergent situation, but if the best results are to be obtained they should be kept up frequently and insistently through the fire season.

A large supply of publicity material in the form of tree games was secured from the Federal Forest Service. These were given a wide distribution particularly in settlements within or adjacent to forested territory.

UNEMPLOYMENT RELIEF

The operation of four camps, one within the Crowsnest-Bow River forest and three within the Clearwater forest, provided considerable extra work for the staff of these two districts. The work progressed in a very satisfactory way and with comparatively little difficulty from the men.

The operations undertaken were important. When completed they will have an influential bearing on the protection and administration of certain forested territory, and will no doubt be greatly appreciated by persons desiring to travel by motor car.

The reconstruction of the Red Deer road will provide for safe travel into the upper Red Deer valley, while the construction of the Haven road west of Nordegg will provide similar facilities in the upper valley of the North Saskatchewan. The latter project opens to the motor tourist one of the finest mountain valleys in the Province, and when eventually linked up with the Jasper-Lake Louise highway will undoubtedly be a popular section of the scenic highways of the Province. In addition it will be extremely useful in connection with forest protection and administration.

The foregoing report deals in a general way with the various activities of the Forest Service during the fiscal year under review. Particular emphasis has been given to organization and to forest protection. The former has been discussed in detail in order that a reasonably clear understanding of the set-up of this Service may be had. Forest protection being the most important single effort of the Service upon which the timber industry depends for future supplies of raw material, it is essential that the year's operations be reviewed in this light.

The reports of the Chief Timber Inspector and of the forest officers in charge of forest reserves and divisions of the Rocky

Mountains forest reserve follow and provide information in detail with respect to the operations for which each individual is responsible.

In conclusion, it should be pointed out that the success attending the efforts of this Service as a whole may to a very considerable extent be attributed to the fine degree of harmony and loyalty which existed between various officers of the Service and the co-operation which has been extended from other divisions of the Department and sections of the Government.

REPORT OF THE CHIEF TIMBER INSPECTOR, F. W. NEILSON

To properly cover the activities of the timber inspection service of this branch during the fiscal year ending March 31st, 1933, some mention must be made of the organization in the preceding year in comparison with the system under which we are now working.

Previous to the last fiscal year the Province was divided into six inspection districts with five inspectors working under the Crown Timber Agent, Edmonton, one under the Crown Timber Agent, Calgary, and a chief timber inspector working over the whole Province with the various inspectors in co-operation with the crown timber agents, but directly under the supervision of the Director of Lands.

During the same period, in the areas covered by the Edmonton, Grande Prairie and Peace River land districts, there were employed under the Director of Forestry four sub-chief fire rangers, each of whom was in charge of the seasonal rangers in his division. There was also a supervisor in charge of both fire protection and inspection service in the area then covered by the Lesser Slave forest reserve, under whom, besides the seasonal rangers, were two permanent rangers with the same status in salary as the four sub-chief rangers mentioned. A clerk was also employed on the reserve in a permanent capacity, making in all a total permanent staff of fourteen to cover timber inspections and fire protection in the northern part of the Province. The inspector working under the Crown Timber Agent, Calgary, brought this total to fifteen.

It will readily be seen that this staff, all having some part in matters pertaining to the forests of the Province, were under divided authority and not at all times in harmony.

At the beginning of the fiscal year ending March 31st, 1933, a new system was put into effect by which all timber inspection work was brought under the Director of Forestry. The Lesser Slave forest reserve was abolished, and that portion of the Province north of the Calgary district divided into eight timber inspection districts with an inspector in charge of each. The districts are divided into fire protection divisions, in each of which there is a seasonal fire ranger who is responsible to the inspector of that district.

In addition to the staff of inspectors, the appointment has been made of a timber investigator whose particular duties are to make final cruises in connection with the sale of license timber berths and to investigate any large areas of timber on provincial lands in

order that the Department may gradually acquire a knowledge of the timber resources of the Province.

In the area south of the Edmonton land district all timber inspection work is now being carried on by the supervisors of the Clearwater and Crowsnest-Bow River forest reserves, and the results of the new system have been not only the co-ordination of the work, but a reduction of staff from fifteen to ten.

The work of the inspectors is scattered over large areas, and each has been provided with a Ford coupe for rapid transportation, although in the more inaccessible parts transportation is necessarily by way of team, saddle horse, boat or raft and on foot.

The duties of the inspectors under the heading of "Timber Inspections" consist of checking all logging or other operations on the various berths and ascertaining whether the sale of timber from unpatented homesteads is being carried out under authority of permits. Patented lands in timbered areas are also checked to ascertain if timber reported as having been sold from these lands has actually been cut thereon and not on nearby provincial lands. This applies principally to railway ties. Sawmills manufacturing material from berths are inspected, the stock on hand scaled and the sales records checked periodically. Mills doing custom sawing are also checked to see that proper records are being kept and that permits or other necessary documents are on hand authorizing the manufacture of custom material. Monthly statements are submitted showing every sawmill visited during the month whether in operation or not and, in co-operation with the Fisheries division, a special report is submitted regarding any sawmills visited, which may be located on a lake or stream showing whether or not sawdust is being allowed to fall into the water.

All lands which have been applied for as permits berths are inspected and the timber thereon estimated, and in addition to collections in connection with permits, together with the picking up and proper completion of outstanding permits and other documents, the inspector as he travels through his district is always on the lookout for trespass cutting of timber. In short the inspector is the eyes of the Department, and his efficiency is gauged not only by his knowledge of timber, but by his ability to administer the regulations impartially and gain the co-operation of the public generally.

Under the heading of fire protection the inspector is responsible for the work of the fire rangers in his district. The very fact that he is travelling through the various parts of it and is in communication with the different operators serves to keep him closely in touch with the work being performed by the rangers. All fire-fighting equipment is also in his charge, and it is part of his duties to see that it goes out to the rangers in good order in the spring and that it is returned or properly accounted for at the close of the fire season.

Before being submitted to head office, the monthly diary of each of the rangers in his district as well as all time sheets and other expense accounts in connection with fire-fighting and fire reports from the rangers are checked by the inspector.

Inspectors are authorized by the Department of Agriculture to act as game guardians which duties, added to those covered by their regular occupation, serve in taking up their time completely in each of the twelve months of the year.

Certain difficulties have, of course, been experienced in the adjustment necessary to carry on work which is now so diversified, but it is felt that at the end of a year's trial the new system has worked satisfactorily, and that loyal and efficient service has been given by the inspectors.

The following is a list of the inspectors, their districts and headquarters:

Inspector.	District.	Headquarters.
R. S. Wyllie	Edmonton	Edmonton
D. A. McKay	Bonnyville	Warspite
J. R. H. Hall	Edson	Edson
C. Ranche	Athabaska	Westlock
H. D. McDonald	McMurray	McMurray
C. H. MacDonald	Slave Lake	Slave Lake
D. Minchin	Peace River	Peace River
D. Buck	Grande Prairie	Grande Prairie
E. S. Huestis, Timber Investigator, Edmonton.		

CYPRESS HILLS FOREST

REPORT OF THE FOREST RANGER, G. R. AMBROSE,
THELMA, ALBERTA

The Cypress Hills forest, situated forty miles south and east of Medicine Hat, comprises 80.69 square miles of land. It is on a timbered plateau, and as the surrounding country is treeless prairie, the forest is of very great value to farmers and ranchers who are allowed to remove by permit timber for fencing, poles, fuel, etc. The cutting operations, as at present carried on, are very carefully supervised and are largely in the nature of thinning and clearing throughout the area, all timber to be removed being marked by a forest officer. A fireguard is being cut through the Battle Creek valley by timber permittees, who utilize all the wood they cut. A summer resort is in operation in the forest, building lots near Elkwater being leased to persons who wish to build cottages. Improvements constructed or in process of construction at the Elkwater Lake summer resort received the attention of the ranger as other work permitted.

An assistant was employed for short periods throughout the summer to help on the maintenance of various improvements and the marking of timber to be cut by permittees.

FIELD STAFF ACTIVITIES—CYPRESS HILLS FOREST

Classification.	Man-days worked.
Improvements: New construction	51.5
Maintenance	74
Boundary surveys	18
Timber	65
Grazing	20.5
Fish	1.5
Game	4.5
Uses of land	10
Miscellaneous executive duties	148.5
Care of equipment	3.5
Fuel supply	9.5
Haying	3
Travel	2
Days lost on account of weather	3
TOTAL.....	414.5

FOREST PROTECTION

The season was very favourable and no great fire hazard was experienced on this reserve. The reserve is happily situated in that it is surrounded by ranchers who use the forest range almost exclusively and give every kind of co-operation possible. The timber permittees also appreciate the fact that a fire on this reserve would affect them adversely.

Fire signs are posted along the trails and highways throughout the forest, and a system of fire-guard roads is being maintained on the open bench land. Fire lines are being cut through the bush at strategical points. The mileage covered is as follows:

Fire-guard roads	23 miles
Ordinary fire-guards	4.5 miles

Two portable fire engines, 2,500 feet of hose and a ten-man fire-fighting outfit are maintained in good condition.

IMPROVEMENTS

The only new construction attempted in this forest was a short road at Elkwater lake to give access to a business portion of the summer resort. A survey of the north boundary of the reserve was carried out to facilitate the administration of this portion of the area. Buildings, telephone lines and other projects were maintained in a satisfactory condition.

IMPROVEMENT STATEMENT

New Construction:	
Boundary survey	3.5 miles
Road	550 feet
Maintenance:	
Ranger station houses	1
Other buildings	2
Telephone lines	12 miles
Fire-guard roads	23 miles
Fencing	5 miles
Water supply systems	2
Dams	1
Grounds	1

FOREST ADMINISTRATION

Silviculture.

Applications for timber permits were materially reduced this season. This was caused partly from the financial stringency and partly from the effects of the wet season. Roads were in bad condition and early snows prevented permittees from coming to the bush in the fall.

Four bushels of lodgepole pine cones were collected and shipped to Edmonton for the tree nursery at Oliver.

Grazing.

An increase in grazing was noted this season. Owing to low prices cattlemen and farmers were holding their stock for a more favourable market and were looking to the forest range to supply the necessary extra pasture.

The three stock associations were working normally keeping inter-divisional fences in repair and the range salted. Trespass of stock was reduced to a minimum. Loss on the reserve was not heavy considering the number of stock involved. Three head of cattle were killed by lightning, two died from larkspur poison, and

two perished in the first rain storm after being turned on the forest range.

The following table summarizes grazing carried out during this period:

NUMBER OF PERMITS AND TOTAL STOCK GRAZED		
Grazing permits, 72—covering:	Cattle	2,510
	Horses	412

Uses.

The special use permits in force were for enclosed grazing areas, summer resort lots, stacking and feeding areas, and watering areas; also the surface rights for a coal-mining operation.

Recreation.

The forest reserve is being used to a greater extent each year for recreational purposes. Five boy scout camps were located at Elkwater lake this season and week-end campers were numerous. The co-operation received from the public was all that could be desired.

CROWSNEST-BOW RIVER FOREST

REPORT OF THE FOREST SUPERINTENDENT, A. G. SMITH, CALGARY

The forest dealt with in this report is made up of two adjoining sections, the Crownsnest division and the Bow River division, which were amalgamated in the spring of 1932 to form the Crownsnest-Bow River forest, part of the Rocky Mountains Forest Reserve. It is made up of mountain and foothill country on the east slope of the Rocky Mountains, extending in a long and comparatively narrow strip from township 2, ranges 1, 2, and 3, to township 35, range 8. The western boundary extends from Waterton Lakes National Park, in township 2, north along the Alberta-British Columbia interprovincial boundary line to township 20. From this point north, the Banff National Park abuts the forest and the eastern boundary of the park is the western boundary of the forest. This common boundary line extends north to township 32. The boundary between the Bow River forest and the Clearwater forest runs northeast to township 35, range 8, the most northerly point of the Crownsnest-Bow River forest.

This forest is from 12 to 36 miles wide, the eastern boundary being planned to include within the forest those foothill lands which are more valuable for timber and watershed protection than for agricultural purposes.

The Crownsnest division has an area of 1,304 square miles, and comprises the drainage basins of the Oldman river and its tributaries, including Willow creek, Livingstone, Crownsnest and Castle rivers and small tributaries of the Waterton river.

The Bow River division contains approximately 3,499 square miles, and comprises most of the drainage basins of tributaries of the Red Deer and Bow rivers, including the Ghost, Kananaskis, Elbow, Sheep, and Highwood rivers.

The most important activity during the year under review was work on improvements coupled with fire protection. All the field staff were required to spend a considerable time in the prevention

and detection of forest fires. A great deal of work was done in the maintenance of improvements such as roads, trails, buildings, telephone lines, and fences. The administration of the various revenue-producing branches of the work was well attended to in the supervision of grazing, timber, and use privileges. Grazing, especially, required a great deal of attention in the past year. The operation of an unemployment relief camp was a heavy additional burden to this office and to some members of the field staff.

The field staff of the Crowsnest-Bow River forest consists of thirteen district forest rangers and ten assistant forest rangers. In addition to these, eleven men who serve as patrolmen, lookoutmen and telephone operator are employed for protective work during the fire season. Only two rangers are employed permanently and two others are employed for eight months at full pay and four months at half-pay. None of the other members of the field staff work on the forest more than eight months in the year. The district forest rangers attended to the more important administrative and protective duties and directed the activities of the assistant rangers and patrolmen.

FIELD STAFF ACTIVITIES—'CROWSNEST-BOW RIVER FOREST

Classification	Man-days worked
Improvements: New construction	146
Maintenance	1,348
Fire-fighting	72
Fire patrol (including lookout work)	1,362
Timber	438.5
Grazing	207.5
Fish	71
Nurseries	14
Game	227
Uses of land	17
Miscellaneous executive duties	722
Care of equipment	340.5
Fuel supply	112.5
Haying	95
Travel	489
Days lost on account of weather	16
TOTAL.....	5,678

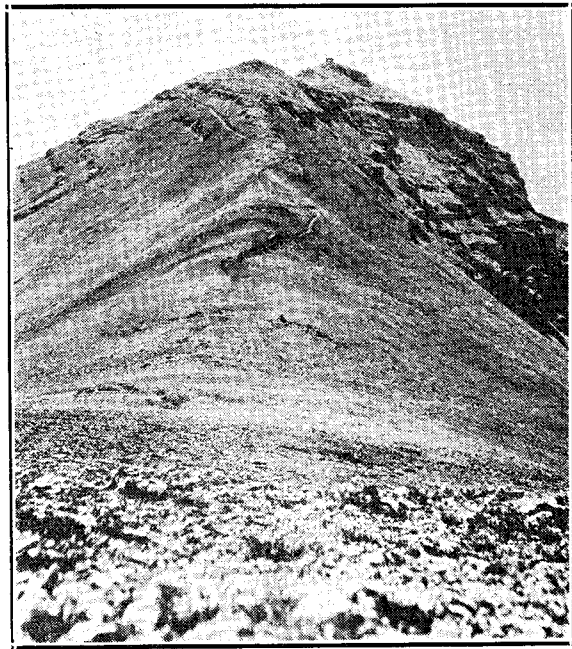
FOREST PROTECTION

The weather conditions during the early part of the fire season were not favourable for the starting of forest fires. From about the 15th of July to the middle of August weather conditions were such that this period was moderately dangerous, and most of our fires occurred then. Between the middle of August and the 10th day of September, fairly heavy rains fell at frequent intervals over the entire forest. In the fall of 1932, from approximately September 11th to October 5th, fire conditions were not particularly unfavourable for protection, although there were frequent intervals of fairly dry weather accompanied by heavy winds. Some few snow flurries held the fire hazard in check and no difficulty with fire was experienced. At the end of this time, heavy winter snows fell and reduced the danger to a minimum.

The principal human agencies causing fires in the forest were travellers, oil well operators and settlers. A fairly close control of the public is kept by means of travel permits and register books. No person is allowed to travel in the forest without a permit, which is issued free. The permits are obtained from forest officers and registers are located at points most convenient to travellers. As a

general rule, the public has been found most willing to co-operate in the matter of fire protection. Excellent co-operation has been received from the various mining companies and other interests operating on or near the Crowsnest-Bow River forest.

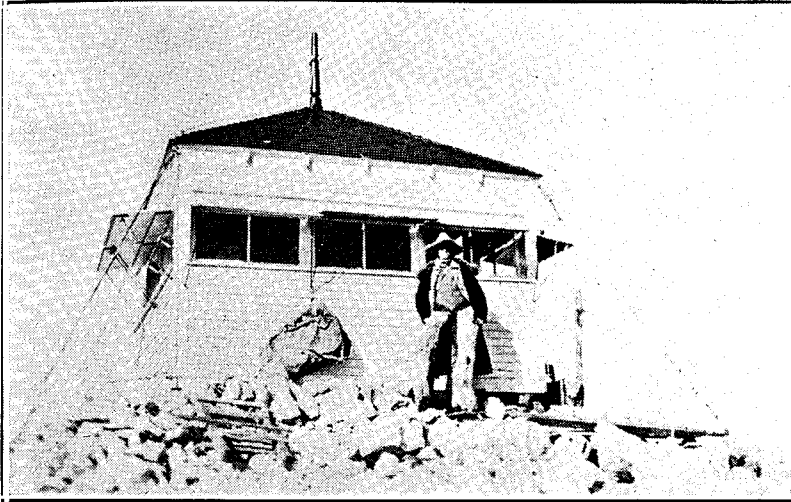
Owing to the lack of funds, very little publicity work could be undertaken during the period under review. At various times articles appeared in the press warning the public about forest fires. The publicity car of the British Columbia Forestry Association toured southern Alberta, the men in charge showing pictures of wild life and giving lectures on forestry. A large number of tree games were distributed to children living near the forest, as a means of interesting them in forest protection.



Moose Mountain Lookout Station, showing the lookout cabin on the summit (7,991 ft.) and the trail leading to the summit.

For the detection of fire, the system of lookout towers was relied upon to a large extent, supplemented by patrol in the more popular camping districts. The lookout system of eight stations situated on sites commanding the best views of the forest functioned satisfactorily. All lookout stations are linked with the ground force by telephone and trail. This system of lookout towers and telephones has been very effective in the past in obtaining prompt action on fires started by lightning, which is one of the chief causes of fire in this forest.

Eleven fires were dealt with in the calendar year 1932. Of these, lightning caused 5, smokers 1, campers 2, industrial operations 1, and 2 were incendiary. The total suppression costs were \$3,142.87, which includes \$340.45 for ranger labour. The value of all the timber destroyed was \$4,879.98. The fire at Bragg Creek caused by



Moose Mountain Lookout Cabin. Note guy cables, lightning conductors and protective shelters for windows.



Looking northwest from the Blue Hill Lookout.

campers was by far the largest. Timber to the value of \$3,750.00 was burned and \$1,808.07 represented costs in extinguishing it. The McGillivray Creek and International fires, of incendiary origin, cost together \$1,177.05 to extinguish, burning timber worth \$1,118.80. Of the eleven fires which occurred during the season, it was necessary to employ extra help for nine, and only two could be handled by the field staff without assistance. Due to the unemployment situation, no difficulty was experienced in obtaining crews. Men for the Bragg Creek fire were obtained from Bragg Creek and Calgary, and for the International fire men were recruited from Coleman. For some of the smaller fires, nearby campers and travellers were pressed into service. It is worthy of note that on nearly every fire two or more forest officers were co-operating on fire suppression action.

IMPROVEMENTS

During the past year the improvements on the Crowsnest-Bow River forest have been maintained in a satisfactory condition by ranger labour. No new construction projects were undertaken or completed in the past year, other than those on which work was done by an unemployment relief crew.

The following is a list of those improvements on which actual maintenance work was done by the forest officers:

Ranger station houses	6
Stables	4
Corrals	4
Ranger station grounds	9
Telephone lines	370.5 miles
Roads	145.5 "
Trails, primary	452.5 "
Trails, secondary	155 "
Trails, auxiliary	77 "
Fences	41.36 "

FOREST ADMINISTRATION

Silviculture.

Due to present economic conditions and the low prices prevailing in the lumber market, the past year saw little activity in the timber operations on the Crowsnest-Bow River forest. Slightly more timber was cut in 1932-33 than in 1931-32. Operations in the woods were, for the most part, conducted in a satisfactory manner. There was practically no decrease in the amount of timber sold by permit. Numbers of settlers took out permits to obtain timber for fuel-wood, fencing and similar purposes. A total of 473 permits was issued, bringing a revenue of \$4,130.22.

The tree seed crop on this forest for 1932 was very poor, and very little seed was obtained. A total of eight bushels of spruce, Douglas fir, and pine cones were shipped to Edmonton for the Oliver nursery.

No seeding, planting, nursery work or forest reconnaissance was done on this forest in the past year.

Grazing.

Forage conditions were excellent over the entire forest during the year under review. Heavy rains in May and June of 1932 induced an abundant and rapid growth on practically all areas. The stock entering the forest at the first of the season were in fair condition, with the possible exception of some stock which was put in the Big Horn district. There was a slight increase in the use of the forest range for the 1932 season over the season for 1931. The market for cattle was unfavourable, prices being lower than for some years.

The entire Crowsnest section and the Sentinel and North Sheep grazing divisions on the Bow River forest were used to capacity. The range management by individuals and associations, grazing stock in the forest, was carried out in a satisfactory manner, the distribution of stock and salting being done properly in all divisions. No cases of wilful trespass were reported.

On the Bow River division approximately twenty head of stock died of Ergot poisoning, and two head of cattle were reported to have been killed by mountain lions in the Big Horn district. A

few sheep were killed by bears and other predatory animals on the South End grazing division of the Crowsnest area.

NUMBER OF PERMITS AND TOTAL STOCK GRAZED

Grazing permits—covering: Cattle	16,759
Horses	2,073
Sheep	7,465

Uses.

Uses of land embrace all surface rights privileges granted in the form of lease or permit, usually in conjunction with oil drilling, mining, grazing operations, trapping or recreational uses. Very few new uses were authorized during the 1932-33 fiscal year. Oil drilling projects were comparatively inactive. Use privileges in connection with grazing, such as corrals, herders' cabins, fences, holding pastures, etc., established for the handling of stock, were again utilized as in the past.

Recreation.

The Crowsnest-Bow River forest was used considerably in 1932-33 by sportsmen for hunting and fishing. A large number of campers and travellers was registered. The popularity of the forest with this class of people is increasing yearly, tourists especially becoming more numerous. Co-operation of these visitors in fire protection and general conservation has been very satisfactory.

All feasible assistance was given the travelling public. In various ways the field staff and forest headquarters have been able to provide assistance, especially in giving information to tourists. Contacts of this nature are relied on to build up good-will between the public and the Forest Service. The past year has seen excellent progress in this work.

Unemployment Relief.

Unemployment Relief Camp No. 14, located in the Red Deer district of the Bow River division, was operated under the supervision of this office. Following is a summary of the work done by this camp:

ROAD WORK (Red Deer road, leading to the Red Deer ranger station):

Cleared and stumped	9.25 miles
Graded	14 "
Culverts built	26 "
Rock removed	8,750 cu. yds.
Dirt removed	84,185 "
Gravel removed	310 "

BRIDGES:

- 1 with one 20-foot span, 6 feet high.
- 1 with three spans, 60 feet long, 20 feet high.



New Bridge over Bull Creek on the Red Deer Road



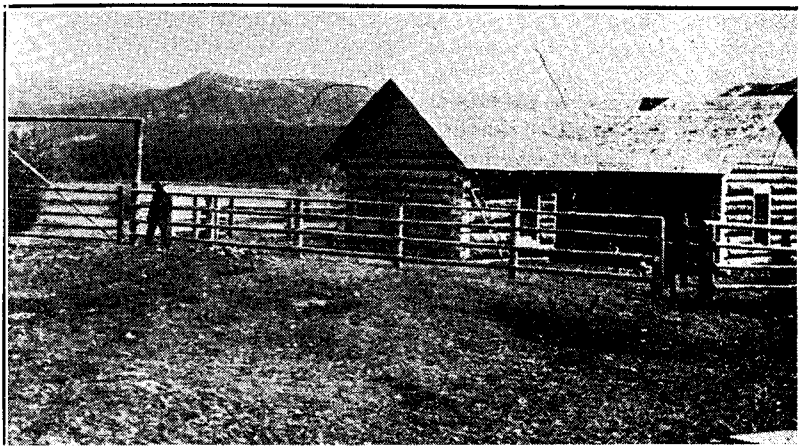
Rock cut on the Red Deer Road.

BUILDINGS (erected on the site of the Red Deer ranger district headquarters):

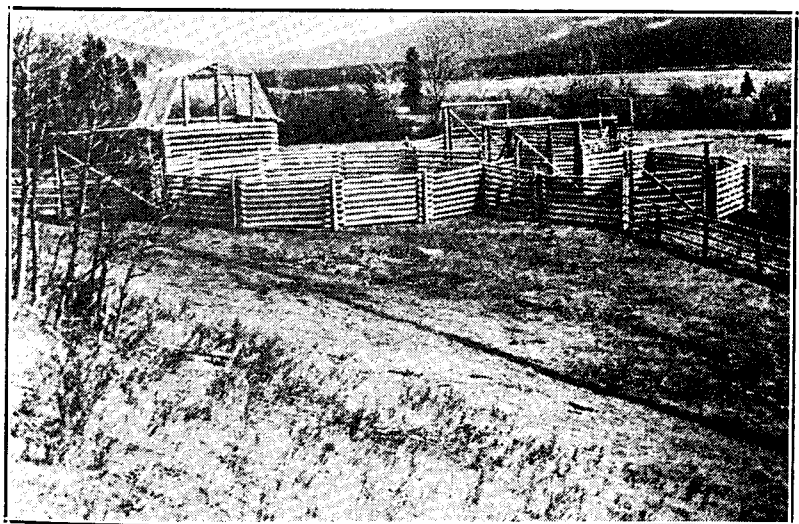
Ranger station house	50' x 32'8"
With lean-to kitchen	15' x 12'10"
Bunk house	18' x 16'
Stable	30' x 20'
Warehouse	28' x 26'

 All buildings were made of logs on a cement foundation. Roofs are of shingle over framework. None of them are yet complete.

CORRALS: A complete set of corrals consisting of three enclosures, with 200 feet of fencing, was also built at the Red Deer district headquarters.



New Red Deer Ranger Station House.



New Corrals and partially finished stable at the Red Deer Ranger Station.

CLEARWATER FOREST

REPORT OF THE FOREST SUPERINTENDENT,
J. P. ALEXANDER, ROCKY MOUNTAIN HOUSE, ALTA.

The operations of the provincial Forest Service in the Clearwater forest reserve district consist of the administration and protection of the reserve, fire protection of provincial lands in fire ranging districts Nos. 1 and 2, timber inspection of provincial lands lying adjacent to the east boundary of the reserve, and supervisory administration of the work of such unemployment relief camps as are operating within the forest reserve.

The Clearwater forest reserve comprises approximately 4,000 square miles of the Rocky Mountains Forest Reserve, lying between the Red Deer river-Clearwater river summit on the south, and the Brazeau river on the north. The west boundary adjoins the Banff and Jasper parks and the east boundary varies from range 8 at the south end to range 12 at the Brazeau river in the north.

Fire ranging districts Nos. 1 and 2 comprise approximately 1,400 square miles along the east boundary of the forest reserve. The unsettled portion of this area supports practically all of the timber growth of this district outside of the reserve.

The Rocky Mountain House Timber Inspectorate includes all lands between townships 34 and 42 situated to the west of the Canadian Pacific Railway Company's Calgary-Edmonton line.

The topography of the above areas varies from the purely mountainous regions of the hinterland of the forest reserve, through the rolling country of the outer reserve lands and the fire-ranging districts, to the more gently rolling prairie lands adjacent to the railway line or east boundary.

Owing to an exceptionally wet summer season during the year the staff was not greatly exercised with fire prevention, apart from the issuance and control of fire permit burning. It was therefore possible to devote considerable time to the more pressing activities of improvement maintenance and relief camp work which was diligently carried out throughout the season. It is regretted that the press of more urgent administrative work prevented as much timber inspection as might otherwise have been undertaken. However, detailed attention was given to this work in the time that was available, and it is thought that some improvement in the conditions of timber operations throughout the area was obtained.

The permanent staff consists of the forest superintendent, forest clerk and one forest ranger. This personnel, during the winter months, would ordinarily be stationed at Rocky Mountain House headquarters, outlying districts being periodically visited, as required. During the past year the unemployment relief camps on the reserve, west of Nordegg, required constant attention with Nordegg as a railhead, so that it was necessary for a ranger to be kept permanently at that point.

The permanent staff was supplemented during the six months season, May to October, by the addition of three forest rangers and eight assistant rangers, located as follows:

Clearwater district—1 forest ranger and 1 assistant ranger.
 Ram district—2 assistant rangers.
 Brazeau (east) district—1 forest ranger and 1 assistant ranger.
 Brazeau (west) district—1 forest ranger and 2 assistant rangers.
 Fire-ranging district No. 1—1 assistant ranger.
 Fire-ranging district No. 2—1 assistant ranger.
 Headquarters—1 assistant ranger.

The personnel of the districts within the reserve, the four first-named above, was concerned for the greater part of the time with fire prevention and improvement work, new construction and maintenance, and in addition to these duties a percentage of their time is necessarily devoted to general administration within their districts.

The personnel at headquarters and in the fire ranging districts was not required to devote time to improvements, the duties being largely fire and fire permit control, timber patrol and inspection. In addition to these duties, the headquarters' ranger was available for any necessary work within the entire district which might require attention.

It is to be regretted that the press of work in connection with the relief camps prevented the normal distribution of the permanent staff during the winter season as a considerable amount of outside timber inspection and patrol work which would ordinarily have been carried on was unavoidably left undone and at a season when the timber activities were at their maximum. Fortunately, such checking as has been done lately, has shown that the winter's timber operations were much better than anticipated.

FIELD STAFF ACTIVITIES—CLEARWATER FOREST

Classification	Man-days worked
Improvements: New construction	71
Maintenance	693.5
Fire-fighting	5
Fire patrol (including lookout services)	649
Timber	79
Grazing	281
Fish	6
Game	14
Uses of land	5
Miscellaneous executive duties	208
Care of equipment	159
Fuel supply	18
Haying	38
Travel	169
Unemployment relief	196
Days lost on account of weather	6
TOTAL.....	<u>2,597.5</u>

FOREST PROTECTION

Weather conditions during the fire season of this year were such that there were no periods of extreme fire danger. There was a short period of some hazard during the early days of May, but this was soon overcome by heavy rains in the latter part of the month and the remainder of the season may be said to have been practically free of any appreciable hazard, although there was again a short spell of average danger in the early fall which was definitely relieved by early snowstorms in October. This snow remained on the ground throughout the winter.

By far the greater number of persons using this reserve for recreation, camping, fishing and hunting were either local residents

or tourist parties accompanied by licensed guides. For this reason it is no doubt safe to state that the fire danger from human agencies was reduced to a minimum as local residents are, as a rule, careful with fire and outside parties are controlled by their guide, who naturally protects his established territory.

In the timbered areas outside of the reserve, there is unfortunately, a small proportion of the people who are not at all averse to incendiarism. The number of such persons, however, is comparatively small, and there is reason to suppose that there are sufficient responsible settlers throughout the district to combat this danger to a very large extent.

Prevention of fire is largely the control of human activities. This is accomplished within the reserve by free travel permits, and in the fire ranging districts by free burning permits. These permits, in either case, are issued from this office or by rangers in the field, the permittees being given necessary precautions with regard to their handling of fire at the same time.

At boundary entrances to the reserve where there are no rangers and in the railways towns within the reserve, boxes and permit blanks are available for persons going into the forest so that they may register their presence without the necessity of going too far out of their way to actually report in person.

Co-operation from the public has been very good. Cases of travelling within the reserve or of burning in the fire ranging districts without permits have been practically negligible. Also on a number of occasions small fires have been wholly extinguished without reference to the forestry personnel.

Publicity during the past year has been largely confined to the issuance of travel and burning permits which entails direct contact between the staff and the public, and through such personal contact as is obtained through the patrol of the rangers. The only organized publicity which was undertaken was some distribution of forestry games amongst the school children of the district.

Except in periods of extreme hazard, the ground staff, consisting of the rangers, is not ordinarily occupied with detection other than as carried on in conjunction with their routine improvement work and general administration. Generally the lookout system is depended on altogether for fire detection, and the efficiency of this system has been found to be very close to one hundred per cent.

Fires are reported by telephone from either the Baseline or Coliseum lookouts as soon as they are located. A check is then made from the headquarters' lookout at Rocky Mountain House and, providing there has been no burning permit issued for the location designated, an investigation is immediately made.

The three lookouts, mentioned above, cover the entire area concerned, and as at least two of them may get bearings on almost any point, their efficiency is such that under ordinary conditions of visibility no fires should get too great a start to be effectively handled.

As a general rule suppression of any fire is controlled by the personnel of the district in which the fire occurs. However, should that of an adjoining district be more favourably located for early action by reason of labor supply or transportation, the initial

handling of the fire would be undertaken by them until such time as the regular personnel arrived. This applies to fires both inside and outside of the reserve with the exception of those outside the forest on land other than provincial land. In such cases the municipalities or individuals interested are required to control the fire, supervision being given by the personnel to ensure that it is not allowed to burn unchecked.

Within the reserve, improvements assisting in the suppression of fire have all been constructed by the reserve personnel, and are maintained in good serviceable condition. Such improvements consist of roads, trails and telephone lines with mileages as follows:

Roads	67 ½ miles
Trails	785 "
Telephone lines	181 "

In the outside districts, suppression activities are affected by public improvements throughout the area.

The equipment used in fire suppression varies from the highly specialized gasoline fire pumps and other purely fire-fighting instruments to the more plebian tools, such as shovels, axes, water pails, etc., of which there is a fairly satisfactory supply. These appliances are generally stored at the reserve and district headquarters whence they are sent out, as required, to fires as they occur. A small supply of tools is also kept at favourable locations throughout the district for outlying use where they will be immediately available in case of fires discovered which are small enough to be handled without the necessity of sending out any larger supply from headquarters.

During the past year, the losses from fire were reduced to a minimum. No large fires occurred anywhere within the district, and such incipient outbreaks as were experienced were readily controlled with very little expense.

IMPROVEMENTS

With the exception of a short period in the early fall, when it was considered necessary to hold the rangers within ready reach of their headquarters in case of fire, the past season was exceptionally wet, with the result that there was a minimum of fire hazard, and the personnel was enabled to devote the greater part of its time to improvement work. Such work was very largely expended on maintenance of existing projects which resulted in their being brought well up-to-date.

One important new project was undertaken in the construction of a cabin at the Shunda ranger station for the purpose of furnishing housing for the assistant ranger in this district. This work was carried on principally in periods of wet weather and solely by ranger labour. The cabin was not completed, there still remaining a part of the shingling and the interior finishing to be done.

A number of minor projects were also initiated during the season, consisting chiefly of secondary trails. Little time was available for this work, with the result that none of the projects were completed. They will, however, be added to from time to time until finished.

Maintenance work was applied to all classes of improvements such as buildings, telephone lines, roads, trails and miscellaneous projects. By far the greater part of the time was spent on telephone and trail work, the building and miscellaneous maintenance consisting almost entirely of routine in minor upkeep.

Telephone line and trail maintenance is of vital importance in the matter of fire detection and suppression. Such work varies from the simplest straight clearing work, through increasingly complicated upkeep of re-grading and drainage of trails and the re-hanging of wire for telephone lines, to the actual re-location stretches of either class, where the original locations have become so damaged as to require such action. All of this work was carried on during the past season, with the result that, with a few minor exceptions, all improvements were brought into excellent condition.

IMPROVEMENT STATEMENT

New Construction:		
Trails, secondary	5	miles
Trails, auxiliary	44	"
Cabins	1	
Wells	1	
Maintenance:		
Trails, primary	604.75	"
Trails, secondary	155.5	"
Roads	19.5	"
Telephone lines	176.50	"
Fences	15.75	"
Corrals	3	
Wells	1	
Ferries	1	
Flagpoles	1	
Ranger station houses	1	
Cabins	5	
Stables	2	
Other buildings	3	

FOREST ADMINISTRATION

Silviculture.

The disposal of timber from this forest reserve under sale is not greatly influenced by general economic conditions, except in so far as the sales are practically all in favour of the several mining companies along the Brazeau subdivision of the Canadian National Railways and their operations, which are dependent on general conditions, determine the amount of timber taken out each year.

Timber permits on the reserve are normally taken out by settlers along the boundary only or by residents in the towns along the Canadian National Railways Brazeau subdivision, and in the great majority of cases only fuelwood was desired. Permits for the past year were possibly somewhat below normal, but not sufficiently so as to require comment.

Timber sales, as stated, were largely confined to the operations of the mining companies and, as their actual cuts are governed by their coal mining activities, there was no extensive cutting during the year, the mines having operated on very reduced schedules. Similar conditions having applied for several years past, it need only be stated that a considerable improvement may be anticipated as soon as general economic conditions improve.

Altogether, within the reserve, four timber sales were in operation and thirty-five timber permits were issued during the year.

In the timber districts outside the reserve timber sale or berth operations were practically at a standstill. Contracts were awarded

by the Canadian National Railways for a fair number of railway ties during the spring, and a considerable proportion of such ties was taken from berths. Apart from these railway ties, such operations were at a minimum.

The latest regulations placing some restrictions on permits, as compared with former procedure, no doubt resulted in there being a considerable reduction in the number of permits issued. Records show a total of forty-three permits for the year.

In addition to the operations mentioned, there has been some cutting of timber from patented lands. Such cutting has consisted very largely of mine props, railway ties and mine ties, large quantities of which are handled by dealers at Rocky Mountain House.

Grazing.

Although the Clearwater forest reserve provides a number of large areas of excellent grazing lands, these areas are very largely located at a considerable distance from the settled country and, as the routes of access for stock are confined to trails through the heavily wooded intervening country, there has never been any appreciable demand for range. Furthermore, the nearer settled country is not, to any extent, a stock raising one.

Such grazing permits as are issued for the reserve are practically all confined to local residents. These permittees commonly allow their stock, work and saddle horses and milk cows to remain on the range throughout the year, taking out the necessary permits to cover them. Under such circumstances, the use of the range is not apt to vary appreciably from year to year, at least until such time as general economic conditions show considerable improvement.

While there are comparatively few permits issued for the reserve, the available grazing is well utilized. Undoubtedly there are considerable number of stray horses throughout the range. However, the bulk of the range is occupied by large numbers of horses belonging to the Stoney Indians. These Indians are squatters who have established their residence within the reserve, and have allowed their horses to range throughout the area and to increase to numbers out of all proportion to their usefulness. In fact, by far the greater part of them are virtually wild horses.

Such Indian stock should undoubtedly be considered a trespass, however, as this condition has been allowed to go on from year to year since the formation of the reserves under the Dominion regime, and it is difficult at this time to arrive at any practical solution of the matter.

There is no doubt that the large numbers of trespass horses will have to be controlled in some manner before any definite grazing administration may be put into force. It is altogether probable that improved stock conditions will encourage an expansion of stock industry, possibly to a point where the use of some of the larger grazing areas of this reserve would be favourably considered by larger stock owners, and now would appear to be the time to arrive at some solution of the trespass stock before the possible demand for range becomes active.

NUMBER OF PERMITS AND STOCK GRAZED

Grazing permits—78, covering:	Cattle	41
	Horses	286

In addition to the above permits, a partial round-up of stray horses was carried out on the Clearwater river watershed. Unfavourable weather conditions interfered to a considerable extent with the success of this round-up, but a total of seventeen horses was disposed of from off the range. A second round-up is to be contracted for in the spring season, when it is thought that the stock will be more readily controlled.

Uses.

Under this heading may be considered all permits for miscellaneous occupancy of lands within the reserve, or, in other words, all permits not considered already under timber or grazing. During the year twenty-eight of such permits were issued as follows:

Cemeteries	1
Dams and pipe lines	3
Logging roads	5
Pastures	1
Power and telephone lines	4
Recreational buildings	1
Railway rights of way	2
Mineral surface rights	10
Trappers' cabins	1

With the exception of permits for the pasture and the trapper's cabin, the above permits were all in favour of commercial enterprises. These consisted of the several mining companies along the Brazeau subdivision of the Canadian National Railways and one lumber company located at Harlech.

Recreation.

The Clearwater forest reserve, while not as favourably located as the reserves to the south, being farther removed from good means of travel, furnishes, however, recreation to large numbers of persons during the open months of the year. Fishing, hunting and camping find many supporters throughout the area during the seasons, and 483 free permits were issued during this period, admitting slightly more than 1,000 persons. The fact that many of the residents of the towns along the railway do not secure permits on all occasions for their trips on the reserve would intimate that the above figures could be materially increased.

Public Relations.

Co-operation with the public, with respect to this reserve, is practically confined to those persons commonly utilizing the reserve for recreational purposes; also, to the Canadian National Railways and the mining companies located within the reserve along its right of way.

The recreational users of the reserve are very largely periodic visitors from year to year who appear to realize the value of protecting their interests, with the result that, with few exceptions, they fully co-operate with the reserve personnel. Co-operation from the commercial enterprises referred to is excellent, and leaves little to be desired.

In the fire ranging districts, adjoining the east boundary of the reserve, the co-operation given comes almost entirely from the settlers and municipal councils. From a fire viewpoint conditions are quite satisfactory. Practically no infractions of the fire laws have been noted, and excellent response from the municipalities has been given on those occasions when action has been requested.

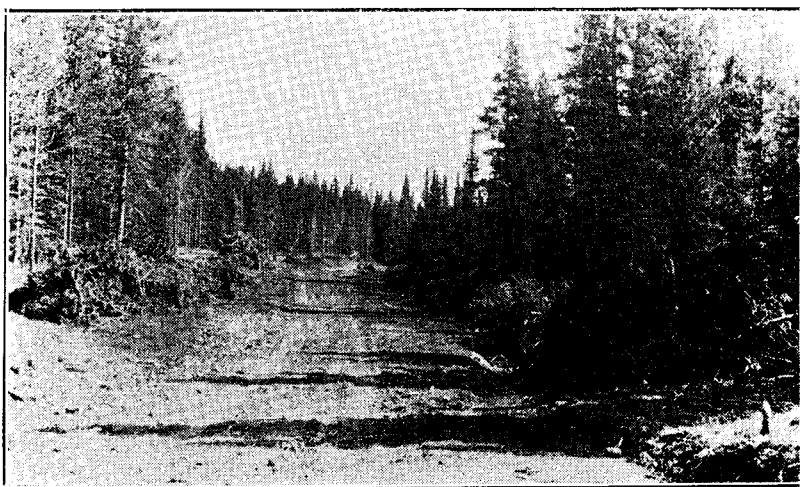
From a timber standpoint, there appears to be some room for improvement, in that many of the settlers are not averse to removing timber from provincial lands without permits. It is not known to what extent this condition has been present in past years, but it is thought probable that present conditions have become aggravated due to the times, and settlers have taken this means of obtaining some ready money for current needs.

Unemployment Relief.

In line with the necessity of providing relief work for the many unemployed single men from the cities of the Province, the request came early in the year to establish two unemployment relief camps on the Clearwater forest reserve. These camps, Nos. 5 and 10, were originally opened on the 25th of May with a full complement of fifty relief workers to each camp.

The two camps operated continuously with varying numbers of workers until the middle of August. At this time camp 5 was transferred to the Department of Public Works and sent to take part in road operations from Nordegg to Rocky Mountain House.

Camp No. 10 continued alone on the Haven road work until mid-December, when it was supplemented by Camp No. 5, which was returned from the Nordegg-Rocky Mountain House road. A third camp, No. 11, was also sent in early in January, and these three camps continued to function throughout the remainder of the year.



Completed grade and clearing, brush to be burned

The work of these camps was all devoted to the Haven road, preliminary plans for its location having been prepared some years previously under federal control. The completed road will generally follow the main valley of the North Saskatchewan river from Nordegg to the boundary of Jasper Park, where it will connect with the road now being constructed between Lake Louise and Jasper. On completion, this road will furnish a main route of travel between the settled country to the east and Banff and Jasper



Beginning the grade down to the Bighorn River

Parks. In so doing it will provide a scenic and tourist highway through some of the most picturesque mountain country of Alberta.

The work done by the three camps consisted of all possible and requisite road work from simple clearing to actual grading of the right of way and the burning of the resultant brush as weather permitted. This work was carried out over a distance of approximately $18\frac{1}{2}$ miles from station 129 to station 1119. The following was accomplished.

Clearing and brush-burning	99,000 ft.
Grubbing stumps	90,000 ft.
Grading (not standard)	29,700 ft.
Bridges (incomplete)	2
Culverts (standard grade)	11

No attempt was made in doing the grading to construct any specified standard. The intention was rather to furnish a general operation which could later be brought up to standard by machine work. The present grade furnishes excellent transportation facilities for any machinery which might be required for the completion of the road, and it also provides good working conditions for such machinery.

During the progress of the camps, 23,538 man work-days were put in on the road, furnishing that amount of single unemployment relief.

In consideration of the fact that practically all of the work done was the result of straight hand labour, a survey of the total length covered will show very satisfactory results.

BRAZEAU-ATHABASKA FOREST

REPORT OF THE FOREST SUPERVISOR, F. G. EDGAR, COALSPUR, ALBERTA

The Brazeau-Athabaska forest consists of two divisions of the Rocky Mountains Forest Reserve, one lying to the north and the other to the south of the Athabaska valley. The northern or Athabaska division lies along the eastern and northern boundary of Jasper Park and British Columbia boundary from the Athabaska

valley on the south to the sixteenth base line on the north, and is approximately 3,822 square miles in area. The southern or Brazeau division with an approximate area of 1,819 square miles lies along the eastern boundary of Jasper Park from the Athabaska valley on the north to the Brazeau river on the south.

In addition to these two divisions the officers of this forest are responsible for fire detection and suppression in two adjoining areas not included in the forest itself. The first is the Athabaska River valley, an area of 129 square miles which separates the two divisions of this forest. The second is bounded on the south and west by the Athabaska division of this forest, on the east by the sixth Meridian, and on the north by the sixteenth base line, and contains approximately 1,358 square miles.

Unit	Area		
Athabaska division	3,822	square	miles
Brazeau division	1,819	"	"
Athabaska district	129	"	"
Northern district	1,358	"	"
TOTAL	7,128	"	"

All of this area is rough foothill and mountain country, intersected by numerous rivers and streams. Except for a few patches of meadowland along some of the river and stream valleys, it is all covered with forest growth.

The activities of the forest staff during the past year can be divided into three main classes as follows:

PROTECTION—The prevention, detection and suppression of fires.

IMPROVEMENTS—The construction of new improvement projects and the maintenance of all existing improvements.

ADMINISTRATION—The regulation of timber operations, grazing, uses of land, game and fish protection, etc.

FIELD STAFF ACTIVITIES—BRAZEAU-ATHABASKA FOREST

Classification	Man-days worked
Improvements: New construction	312
Maintenance	953
Fire-fighting	32.5
Fire patrol (including lookout services)	1,529
Timber	48
Grazing	26.5
Fish	20
Game	12
Uses of land	32
Claims	17.5
Miscellaneous executive duties	565.5
Care of equipment	191.5
Fuel supply	70.5
Haying	64
Travel	35.5
Days lost on account of weather	74.5
TOTAL	3,984

To carry on the work mentioned, the following staff was maintained during the year: one supervisor, one forest clerk, one full time ranger, one ranger employed eight months at full pay and four months at half-pay, five district rangers, eleven assistant rangers and four lookout men.

Last spring the Athabaska forest lying to the north of the Athabaska valley and the Brazeau forest lying to the south of the Athabaska valley, formerly two separate forests, were amalgamated into the Brazeau-Athabaska forest and were placed in charge of one supervisor, with headquarters at Coalspur, Alberta. The former supervisor of the Athabaska forest was given a ranger position, whilst six former rangers were changed from full time to seasonal

work. This effected a large saving to the Department, and the staff is now at a minimum to handle efficiently the necessary work on the forest.

This forest is divided into eight ranger districts with a ranger in charge of each. During the months of greatest fire hazard most of these rangers are assisted by from one to three assistant rangers, depending on the size of their districts.

FOREST PROTECTION

Forest reserves are planned and set aside not only for the conservation of timber resources, but also for the protection of headwaters of streams and rivers. It is of greatest importance that these areas be kept free from fires, which not only destroy the standing timber and ground cover, but frequently burn off the soil itself right down to the underlying rock.

Fire protection is therefore the most important activity on this forest reserve. Due to the fact that there are several railway lines crossing this forest and that there is quite a large resident population, fire protection is a serious problem. Fires caused by sparks from locomotives have decreased greatly during the past few years due to the introduction of new types of locomotives with improved spark arresters, and also because the railway is burning a better class of coal in its engines. Fortunately the past season was not one of great fire hazard except for short periods during the months of June, August, and September. Rainfall was decidedly up to the average and was well distributed throughout the season.

In spite of the favourable weather conditions, it was necessary to suppress a total of twenty-one fires during this period. Ten of these were attributed to carelessness on the part of campers and travellers, four to railways, three to lightning, three to incendiarism and one to unknown cause. They burned over a total of 1,300.42 acres and cost \$394.33 to suppress. The loss in timber was \$3,917.95.

Travel in the forest was regulated during the year by means of permits or registration. Persons making a short trip of two days or less were required to fill out a registration form, stating where they intended to travel or camp and how long they would be away. Supplies of these forms were kept either by the postmaster or by a storekeeper at each one of the mining camps situated in the forest. These forms, when filled out and signed by the traveller, were deposited in boxes provided for that purpose and collected at frequent intervals by the rangers. Persons making a prolonged trip for the purpose of camping, fishing, or hunting were required to secure a free permit directly from one of the rangers, the head of each family or party only being required to fill out the form. During the past season 550 of these forms were filled out, and as each of them covered an average of two people, approximately 1,100 people made use of this forest for recreational purposes. These systems help to a great extent in controlling travel and in making travellers more careful about leaving unextinguished camp fires behind them.

A considerable amount of publicity throughout the past season was given to forestry work, emphasizing its aims by the fish and game associations in the district. These associations seem ready at

all times to co-operate in every way possible with a view to conserving forest resources. The Canadian National Railway Company also does its part in fire prevention. Velocipede patrols were made by railway sectionmen whenever weather conditions made them necessary, and railway officials were always prompt in reporting fires even if they were not on railway rights of way.

Fire posters were extensively distributed throughout the mining camps and along all principal trails. Tree games supplied to this area for publicity purposes by head office were distributed to pupils attending school in the district, and in several cases the rangers gave talks on fire protection to the pupils in the schools. Where picture shows operate in the mining camps, fire warnings were flashed on the screen during very dry periods.

Four lookout towers or cabins were manned during the fire season. As there was little heavy smoke from outside fires drifting about this past summer, this lookout system of fire detection proved very effective. Thanks to the promptness of the lookouts in reporting smoke and quick action on the part of the ranger staff, all fires but one were confined to small areas. The one fire that got a good start before action could be taken was a lightning fire which started in a remote mountainous section of the forest and in an area not served by telephone communication. As a result no direct notification could be sent from the lookout man to the district ranger, and it was almost two days before a suppression crew could reach the place. In the meantime a heavy rain had stopped the fire from spreading so that it burned badly for only one day.

As stated before, this forest is divided into eight main ranger districts with a senior ranger in charge of each. With one exception these rangers have telephone communication with the lookouts so that they receive prompt notification of the start of fires. There is sufficient fire-fighting equipment kept in each district to furnish a small crew. If more is required it can be secured from Entrance in the Athabaska division or from Coalspur in the Brazeau division, reserve stocks being kept at both of these points.

Practically all parts of the forest are made accessible by forestry built trails. These are supplemented by Indian trails, logging roads and old tote roads.

At the time of the transfer of the natural resources from the Dominion to the Provincial Government, this forest was well supplied with fire-fighting equipment. As a result very little has been purchased since that date. The only large item secured during the past year was 2,000 feet of high pressure fire hose. All equipment was kept in good repair throughout the year, and was always ready for instant use.

IMPROVEMENTS

Due to lack of funds a number of proposed improvement projects had to be abandoned for the time being. Only a few that could be completed with very little cash outlay were undertaken. A new patrol cabin was erected on the Smoky river in a district where there had been no cabins before. This district is subject to many early and late snowstorms and a permanent shelter of some kind was a necessity. The cabin was constructed of logs with pole rafters, hewn log floor and shingles manufactured right on the spot.

The only cash outlay was for a few nails. Another cabin on the Brazeau river, which had been built several seasons ago, was completed by substituting plaster for the original moss chinking. All other new projects undertaken were of a minor nature, such as a short section of new road, pasture fences, footbridges, etc.

The principal work of the year was the maintenance of existing improvements. Every year a great amount of work has to be done on the numerous miles of trails and telephone lines through this forest. In former years it was the custom to have a small trail crew under a foreman do a good portion of this maintenance work. For the past few years, very little extra labour has been employed in assisting the ranger staff to do this work. However, during the past year, all the trails and telephone lines were gone over and maintained in a satisfactory state. Buildings and pasture fences were repaired as well as other improvement projects. Below is a list of new construction and construction, previously completed, on which maintenance work was performed during the year:

IMPROVEMENT STATEMENT		
New Construction:		
Cabins	2	
Roads	1.3	miles
Trails, secondary (constructed)	12	"
Trails, secondary (located only)	26	"
Footbridges (with span of 69 ft.)	2	
Fences (completed)	4.75	"
Fences (partly completed)	1.25	"
Acres cleared for growing feed	2½	
1 well dug—4'6" x 4'6" x 12'.		
Maintenance:		
Houses	6	
Cabins	9	
Office	1	
Speeder houses	2	
Barns	3	
Bunk house	1	
Telephone lines	199	miles
Roads	4.5	"
Trails: Primary	352.5	"
Secondary	294.7	"
Auxiliary	57.5	"
Fences (approximately 15.75 miles)	12	
Grounds	6	
Corrals	1	
Pasture	1	
Nursery	1	
Water supply system	1	

FOREST ADMINISTRATION.

Silviculture.

Timber operations on this forest were at a low ebb during the past season. Out of nine sales carried on the books during the year, only three were active. This state of affairs was due to the fact that there was little demand for sawn lumber. The railways were buying few ties and the mines were operating only part time, resulting in fewer mine timbers being used. Receipts from timber sales were slightly lower than for the previous year. Following is the cut on timber sales during the year:

501,486 ft. b.m. saw timber
137,324 lineal ft. dry props
241,848 lineal ft. green props
672 mine ties

Two new sales were awarded on the forest this year. These were bid in by local mining companies, and contained 1,500,000 lineal feet of dry timber and 600,000 lineal feet of green timber, all to be used for the manufacture of mine props and mine ties.

As there is no farming district bordering this forest, the sale of fuel-wood under permit was limited to the residents of the mining camps, to whom a small number of such permits were issued. There was also sold under permit during the year a small amount of building logs, corral poles, mine props and lagging. A statement is given herewith of the amount of material disposed of in this way:

Fuel-wood, cords	82
Mine timbers, lineal feet	32,800
Lagging, lineal feet	200,000
Building logs, lineal feet	13,989
Poles, pieces	591

Grazing.

The Brazeau-Athabaska forest, especially the Brazeau division of this forest, cannot be considered as a good grazing area. The meadows which exist are confined to the river and stream bottoms. They are small in extent and inclined in many instances to be very soft.

As the country to the east of this forest is mostly forested and not settled up, there is no demand for summer grazing by the settlers from outside. Grazing permits are therefore confined to parties who keep saddle stock for recreational purposes, to a few dairymen who supply milk to the mining camps and to several outfitters who run their saddle and pack horses on the forest.

Grazing conditions were ideal as the grass came early, was plentiful, and did not freeze down until late in the fall. Winter grazing conditions, however, were not good as snow fell early and deep, and continued to pile up all that season. As a result, a number of horses and much big game died during the late winter and early spring from starvation.

This forest has never been over grazed and could support many times the amount of stock that is on it at the present time.

NUMBER OF PERMITS AND TOTAL STOCK GRAZED

Grazing permits—113, covering: Cattle	103
Horses	549

Uses.

The Forest Service issues leases and permits to cover all uses affecting the surface of land included in the forest and also collects all revenue derived therefrom. These uses include such projects as townsites, railway rights of way, trappers' cabins, hunting lodges, boat-houses, prospectors' cabins, telephone lines, logging and haul roads, landing fields, etc. The following were active during the year:

Townsite leases and permits	25
Trapper's cabin permits	19
Hunting lodge permit	1
Boat-house permit	1
Telephone line permits	2
Prospector's cabin permits	3
Logging road permits	5
Haul road permit	1
Landing field permit	1
Cemetery permit	1
Dam permit	1
Cultivation permit	1
Railway right of way permits	4

Recreation.

This forest is not used for recreational purposes nearly as much as the forests to the south. This is due to the fact that it is not near any large centre of population and is not made accessible to

the motorist. The local resident population, however, takes advantage of the good fishing and hunting that this forest provides, and parties of campers, fishermen and hunters may be met scattered over the area at any time during the summer and early fall months.

Co-operation.

The forest officers try at all times to enlist the support of the public. Forest regulations are rigorously but tactfully enforced, and it would seem that the public is right behind the endeavour to preserve and protect all natural resources. The local fish and game associations are a great help in advancing the idea of conservation and fire prevention.

In spite of the fact that the majority of the field force has had to accept very severe salary cuts during the year, they still seem to have the interests of the Provincial Forest Service at heart, and are carrying on to the best of their ability. Co-operation between head office and the field office has been of the best ever since the formation of the Provincial Forest Service.

The Forest Service handled no unemployment relief camps on this forest during the year.

Fisheries

REPORT OF THE DIRECTOR OF FISHERIES, R. T. RODD

The unsatisfactory economic conditions which had previously influenced the disposal of commercial fish for export remained unchanged for the fiscal year ended March 31st, 1933. The situation is still adversely affected by lack of markets. Decreases are also noticed in domestic fishing and angling as well as in the sale of permits and licenses.

The condition of the fisheries throughout the Province, however, both commercially and from a sporting point of view, was very satisfactory. With the exception of the usual drought prevailing in southern Alberta, which affected some of the streams, trout fishing gave excellent sport. The situation has been closely watched by inspectors and guardians employed and fish in danger of being stranded through low water were rescued and placed in streams which were more favourable, undesirable fish, at the same time, being removed. All the commercial lakes showed improvement. Invariably angling was good, and not much difficulty was experienced in obtaining satisfactory catches.

COMMERCIAL FISHING

Commercial production for the period covered by this report amounts to a total of 2,655,214 pounds, a reduction from that reported on for the fiscal year ending March 31st, 1932, of 682,766 pounds. Value to the fishermen shows a drop of \$21,488.35 and value as marketed a reduction of \$59,119.37. Prices as a whole were unsatisfactory, and operating companies and fishermen had a most difficult year.

Very little new equipment was purchased as a result of the low prices obtainable for products. However, operations on Wabamun and Pigeon lakes were reported as being satisfactory and some profits were made.

Owing to heavy production of trout from the Great Lakes which was almost sufficient to supply the eastern markets, the fishing on Lake Athabasca was kept at a minimum during the season under report. It is extremely doubtful as to whether this lake will be fished to any great extent until market conditions improve.

Fewer fishermen operated at Lesser Slave Lake, which ranks second in importance from a commercial viewpoint. The summer season for fishing showed a large production of pickerel with a fair catch of whitefish which was about all the markets could absorb. The latter species of fish were in evidence all over the lake, but no large schools were discovered and no large individual catches obtained. This lake, which was depleted by over fishing some years ago, is showing signs of improvement, and great numbers of young whitefish are now reported by fishermen. With extensive fishing for pike and pickerel, as now permitted by special arrangement, and with restocking of the more valued species carried on, Lesser Slave will in a few years time be once more an important producer

of whitefish. Lac la Biche shows a large reduction over the previous year, mainly due to marketing difficulties. This lake has been heavily fished for a number of years, and while still in good condition will benefit by the lighter fishing carried on this last two seasons.

Very little if any tullibee could be disposed of, and the catch of this particular class of fish from Lac la Biche where considerable quantities are found was small.

The winter catch at Cold lake was good, but running heavily to whitefish. This is due to the present regulations enacted to prevent the depletion of trout which do not reproduce so rapidly and which are more valuable, from an angling standpoint, as this mode of fishing brings more money to the district. A large quantity of the production from this lake was frozen and marketed locally. Some of the fishing in Cold lake being carried on east of the Alberta-Saskatchewan boundary, the catch from that area was not included in the Alberta production.

This and the fact that no commercial fishing was carried on in Primrose lake in Alberta or west of the boundary may also be given as a reason for the smaller total production in the Province during this year. A good average catch was obtained at Christina lake north of Lac la Biche during the summer which was disposed of satisfactorily. Very little fishing was carried on in Winnifred lake, as this water cannot be fished during the summer due to the difficulty in making a road which would be chiefly through muskeg. The fish are small and not of the same quality as those produced in other lakes, and the price obtainable did not warrant the extra cost of production during the winter season.

A slightly larger catch was taken from Big Whitefish lake and Little Whitefish lake, No. 2, a greater percentage of which was shipped unfrozen. These fish demanded a better price on account of their size.

At Pigeon lake the catch was taken in a very short while, the limitation being slightly exceeded. The number of fishermen operating on this water has been greater for the last few seasons than on any other lake in the Province, and with so large a production in so short a time some difficulty was experienced in disposing of the catch to the best advantage. It is satisfactory to report that the fish from this lake, which formerly were small, have increased in size and weight and are now in good demand in all markets where they are known. A small increase in the winter limitation was allowed on both Pigeon and Wabamun lakes, such increase, on the latter, to be deducted from the following summer limitation. The fish from Wabamun lake are also of excellent quality and demand a good price. As both Pigeon and Wabamun lakes are fished close to the danger mark, a very close check on the yearly catch is necessary to prevent depletion.

Pinehurst, Touchwood, Beaver, Newell and McGregor lakes produced about the usual quantity taken from these waters. Trout and Wabasca lakes were also fished during the season, but owing to the additional cost of transportation to the railway it was found to be unprofitable, and was discontinued after a short trial.

The following table gives the amounts and values of the different species of fish taken by commercial fishing during the fiscal year:

FISHERIES

135

TOTAL AMOUNT OF FISH TAKEN FOR COMMERCIAL PURPOSES—IN ORDER OF IMPORTANCE

	Weight	Value to Fishermen	Value as Marketed
WHITEFISH	May 16/32 to Sept. 30/32..... Dec. 1/32 to Dec. 31/32..... Jan. 1/33 to Mar. 31/33.....	\$15,629.22 347,309 251,567 491,675	\$ 22,029.36 14,277.62 29,883.43
LAKE TROUT	May 16/32 to Sept. 30/32..... Dec. 1/32 to Dec. 31/32..... Jan. 1/33 to Mar. 31/33.....	66,930 8,832 15,665	\$ 4,685.10 528.92 923.20
PIKE	May 16/32 to Sept. 30/32..... Dec. 1/32 to Dec. 31/32..... Jan. 1/33 to Mar. 31/33.....	97,897 102,803 217,131	\$ 2,289.48 2,402.59 4,854.12
PICKEREL	May 16/32 to Sept. 30/32..... Dec. 1/32 to Dec. 31/32..... Jan. 1/33 to Mar. 31/33.....	363,121 15,235 264,219	\$ 27,579.42 3,907.13 13,007.81
TULLIBEE	May 16/32 to Sept. 30/32..... Dec. 1/32 to Dec. 31/32..... Jan. 1/33 to Mar. 31/33.....	35,133 48,610 48,870	\$ 686.22 1,110.90 898.30
PERCH	May 16/32 to Sept. 30/32..... Dec. 1/32 to Dec. 31/32..... Jan. 1/33 to Mar. 31/33.....	13,797 1,290 6,113	\$ 970.26 52.60 295.15
SUCKERS	May 16/32 to Sept. 30/32..... Dec. 1/32 to Dec. 31/32..... Jan. 1/33 to Mar. 31/33.....	117,939 32,031 43,047	\$ 216.40 162.89 46.01
LING			
GOLDBYES			
MULLETIS			
TOTALS	2,655,214	\$94,439.65	\$130,808.51

\$ 66,190.41

6,138.22

9,546.79

44,494.36

2,695.42

1,318.01

425.30

EQUIPMENT

Very little new equipment was purchased during the period covered by this report. Many of the fishermen who were well supplied when there was a good demand for fish were able to carry on with what they had when the markets diminished by reducing their operations. Some have taken up other occupations and have disposed of their nets and fishing gear to those still in the business. This applied to boats as well as nets, so that no new boats were therefore required.

MARKETS

While there was very little, if any, improvement in the export market, except in March when the Jewish trade was an important factor during the time of Festival, some change for the better was apparent in the local demand. The Fisheries Division co-operated with the fishermen and dealers to meet their requirements, and when possible granted extensions to the seasons to meet market conditions.

In an endeavour to further assist in the sale of fish locally the Division at the Edmonton Exhibition continuously displayed a variety of the food and game fishes found in the Province. Demonstrations were also given daily during the entire exhibition in the cleaning, filleting and preparation of fish for cooking. Different varieties of fish were used, the prepared food being given away after each one. Many thousands of people viewed the display and were interested in the demonstrations and success of this feature was evidenced by the fact that a large increase was noticed in the sale of fish, the local dealers having some difficulty at the time in obtaining a supply to meet the demand, which was attributed to this educational work.

In a further effort to increase the consumption of fish in this Province the Department is co-operating with the federal Department of Fisheries in arranging for a series of lectures and radio talks to be given in the larger cities throughout the Province on the food and health values of fish, and cooking demonstrations will also be given wherever possible. This campaign will cover a period of approximately six weeks beginning in April, and will be carried on by that Department's cookery specialist, Mrs. Eveline Spencer.

Judging from reports from other provinces on the success of this work there is every reason to believe that the fishing industry in this Province will also be greatly benefited, especially as a considerable amount of local fish will be used in the demonstrations.

Until the economic situation is changed there is no question that the increase in the local markets will be the chief factor in assisting fishing from a commercial point of view so far as this Province is concerned.

TRANSPORTATION

Motor trucks are now the chief means of transportation from the lakes. No difficulty was experienced in their operation until towards the end of the season, February and March, when heavy snows prevented their further use, and teams had to be used with the exception of two instances, when aeroplanes were operated to transport fish from the more distant lakes. This method of trans-

portation is becoming popular, and should markets warrant, planes will no doubt be used extensively in freighting from greater distances.

DOMESTIC FISHING

This phase of fishing continues to be heavy although a decrease is shown over last season in the number of licenses sold and in the amount of fish taken, possibly due to more angling being carried on by farmers and settlers living close to lakes where free angling is allowed residents of the Province. It is thought that some of those who in former years obtained a domestic license were unable during this period to raise sufficient money for the license fee or purchase of net. The most popular lakes for domestic fishing are Pigeon, Wabamun, Lac la Nonne, Buck, Chin, Cold, Newell, Lac St. Anne, McGregor and Buffalo, all situated in the heart of the farming districts. The estimated amount of fish taken under domestic licenses during the fiscal year was 458,000 pounds, a decrease from the previous year of 89,078 pounds.

INDIAN FISHING

It will be seen from the record of licenses shown later in this report that there was an increase in the number of free permits issued to Indians amounting to 124. An increase of 124,000 pounds is also shown in the amount of fish taken by them as compared with the previous year. The estimated amount taken during the year was 860,000 pounds of all classes of fish.

Occasional trouble is still experienced in the control of Indian fishing, some of them resenting any kind of regulation that will limit their privileges. Indian agents in this particular are always willing to co-operate with this Division in the matter of enforcement.

LICENSES AND PERMITS

A decrease is shown in the number of licenses and permits issued, fishermen and commercial licenses being 157 less in number than the previous year, with domestic licenses reduced by 97. There was also a big decrease in the number of angling permits sold by both the Fisheries and Forestry Divisions, which amounted to 1,658. Indian permits showed an increase of 124. The large decrease in the number of angling permits was due entirely to the economic condition prevailing, a number of sportsmen advising that they were unable to take advantage of this sport because of finances. Many had to sell or cease operating their cars, unless retained for business purposes, and were therefore unable to get to the favourite fishing spots. The following shows the summary of licenses sold and issued during the last three fiscal years:

	Fiscal Year *1930-31	1931-32	1932-33
Domestic licenses	566	555	458
Fisherman and commercial licenses	1,033	755	598
Angling permits sold by Fisheries Division.....	7,731	6,533	4,963
Angling permits sold by Forestry Division.....	.....	566	478
Indian permits	1,130	736	860
TOTALS	10,460	9,145	7,357

*Six months to March 31.

ANGLING

While there was a decrease in the number of angling permits issued, angling still continues to be the more popular form of fishing for coarser varieties of fish. This especially applies to lakes where only species of this nature are found, and farmers and new settlers living close to these waters are responsible for the larger percentage of such catches. The decrease in amount of fish taken is due chiefly to anglers from the cities being unable to afford the operation of their cars and also due to the fact that deep snow during the winter months made the roads difficult for motor travel. This latter reason was perhaps the chief one which caused the decrease. There are numerous lakes throughout the Province where good fishing may be obtained and where no angling permits are required by residents.

Angling in the trout streams of the foothills was good, especially in the Bow and Highwood rivers, and splendid reports were also obtained of grayling and trout fishing around Edson. Reports received from the last named district stated that fishing was excellent and that the extensive stocking with rainbow was showing good results. The catch of over fifty per cent. of rainbow in the Bow and Highwood rivers amply proves that stocking with fry from the various hatcheries is worth while. The estimated amount of fish of different species taken by angling during the fiscal year was as follows:

Trout	220,638 pounds	60,337 decrease
Rocky mountain whitefish.....	135,000 "	44,500 increase
Arctic grayling	67,000 "	19,000 decrease
Goldeyes	4,290 "	8,250 "
Pickereel	177,876 "	137,254 "
Perch	219,625 "	32,675 "
Pike	858,243 "	318,706 "
TOTAL.....	1,682,672 pounds	

OBSERVANCE OF THE REGULATIONS

Prosecutions during the fiscal year under review numbered 89, an increase of 21, and the number of confiscations amounted to 68, or an increase of 28. The following is a summary of the prosecutions which materialized during the year:

Fishing without a license	16
Angling without a permit	15
Fishing in closed stream	14
Fishing in closed season	8
Fishing with illegal nets	7
Having illegal sized trout in possession	4
Pollution of waters	4
Excess of nets	3
Selling fish caught when commercial fishing prohibited.....	3
Not having license number on nets, etc.	3
Selling fish caught on domestic licenses	2
Failing to keep ice clean of waste	2
Refusing to obey a fishery officer's instructions	3
Fishing outside prescribed area	1
Prevention of waste under section 16	1
Having fish in possession during closed season	1
Purchasing fish caught under domestic license	1
Selling fish caught under Indian permits	1
TOTAL.....	89

It will be noticed that the greater number of offences committed were for fishing and angling without licenses.

In the enforcement of the regulations much assistance was given by the various fish and game protective associations. With the

large total membership of these organizations throughout the Province, together with the jealous watchfulness of conditions generally, these organizations have proved to be of especial value when the immense size of the territory under review is taken into consideration. Excellent assistance was also given by the Forestry staff and the Royal Canadian Mounted Police, and the Fisheries officers with this assistance were able to keep a close watch on the fishing throughout the Province.

IRRIGATION

At the close of the season there were some forty-four irrigation schemes in existence in the Province which affected the Fisheries to a greater or lesser degree. As pointed out in former reports these schemes when in operation require regular inspection by the Fisheries' officers to see that the necessary screens are installed where required and are kept in condition. With one or two exceptions no difficulties were experienced as in nearly every case the owner appeared only too willing to co-operate in every way in preventing loss of fish.

In addition to the above some nineteen new schemes were dealt with in conjunction with the Water Resources Branch where much information and assistance was most willingly given. By this co-operation considerable time and expense was saved, and it is pleasing to report that the loss of fish through these irrigation schemes was very small and was more than made up for by the new fishing now obtainable in the several large reservoirs which are created.

DAMS AND FISHWAYS

In addition to five dams erected in connection with the larger irrigation systems there were at the end of the year forty-six others, large and small, built in the streams for power or storage purposes which affected the fisheries. A large number are supplied with fishways. Occasionally a fishway is not required where such construction would not be beneficial, and in the few very large dams the installation of an operative fishway is not possible. All dams are regularly inspected by the Fisheries' officers during the summer seasons and especially during the periods of fish migration.

In a number of instances dams without fishways have proved beneficial, as they have not only created deep pools or lakes, but have also prevented predaceous or destructive fish such as pike, pickerel and suckers from ascending to the trout waters.

POLLUTION OF WATER

Little difficulty was experienced with regard to pollution during the season. The co-operation rendered by the Forestry, and Petroleum and Natural Gas Divisions of the Department in checking sawmills, oil wells and refineries assisted greatly in preventing contamination. Only four prosecutions were necessary during the year for these offences, when convictions were secured against coal companies, one sawmill operator and one power company.

The city of Calgary during the year completed a large sewage disposal plant capable of taking care of sewage from the city for

some time to come. The city of Edmonton enlarged and improved the plants which were already in operation.

FISH CULTURE

This important branch of the Division's work was again carried out very satisfactorily by the various officers directly responsible.

The hearty co-operation of the federal Department of Fisheries, the National Parks Branch and the superintendents of the game fish hatcheries within the parks, in arranging for the supply of eggs, hatching and distribution of fry and fingerlings into provincial waters outside the parks, enabled this Division to carry on the work of restocking streams and other suitable waters of the Province successfully and at a very reasonable expense. But, as shown in former reports, the increasing demand and necessity for restocking will in the near future compel this Government to maintain its own game fish hatcheries in districts which cannot be readily stocked from the federal hatcheries within the parks, the capacity of which is limited. The existing arrangement with the federal Government, however, is most satisfactory for the present time.

Owing to drought in the southern part of the Province some of the streams became dangerously low, and great care was therefore necessary in distributing the fry, as there was a danger of loss through waters becoming too warm or the young fish just liberated becoming stranded. In some instances, therefore, heavier plantings were necessary in those streams where this danger was not present.

A peculiar characteristic of the wild trout, or the product of the hatcheries after they have become established in the streams, is their instinct to seek better waters immediately the streams become low and warm. Very few trout become stranded if the water recedes gradually unless they are completely cut off and cannot escape. The characteristic of self-preservation in this respect does not apply to young fish just liberated from a hatchery, the instinct developing later.

While the number of plantings from the Waterton hatchery showed a small increase over the previous year, the number in the district adjacent to that establishment was actually less, part of the supply being transferred to the district taken care of by the Banff hatchery, where a decrease of plantings was shown.

The failure on the part of one fish farm in its delivery to the Banff hatchery of the total number of rainbow eggs contracted for necessitated this transfer from Waterton to partly make up the Banff shortage. The transfer was made possible on account of the drought mentioned.

During the year there were 65 plantings of fry made from Waterton hatchery, 61 from Banff and 21 from Jasper into waters outside the parks. The details of this distribution are as follows:

WATERTON			
TRIBUTARIES OF SHEEP CREEK:			
Name of Waters	Cutthroat	Loch Leven	Rainbow
North Sheep creek	15,000	.....	.....
Fisher creek	15,000	.....	.....
King creek	5,000	.....	.....
Ware creek	10,000	.....	.....
South Sheep creek	20,000	.....	.....
Blue Rock creek	10,000	.....	.....
Canyon creek	10,000	.....	.....

FISHERIES

141

Name of Waters	Cutthroat	Loch Leven	Rainbow
Gorge creek	10,000	.....	.....
Long Prairie creek	10,000	.....	.....
Wolf creek	10,000	.....	.....
Spring creek	10,000	.....	.....
TRIBUTARIES OF OLD MAN RIVER:			
Adair creek	10,000	.....	.....
Bobs creek	30,000	.....	.....
Burton creek	10,000	.....	.....
Beaverdam creek	30,000	.....	.....
Callum creek	30,000	.....	.....
Damon creek	10,000	.....	.....
Ernest creek	10,000	.....	.....
Fly creek	5,000	.....	.....
Grave creek	10,000	.....	.....
Heath creek	30,000	.....	.....
Hidden creek and tributaries	80,000	.....	.....
Livingston river	35,000	.....	.....
North creek	15,000	.....	.....
Playle creek	10,000	.....	.....
Race Horse creek	30,000	.....	.....
Race Horse creek Beaver dams	30,000	.....	.....
Sharples creek	20,000	.....	.....
Spring creek	25,000	.....	.....
Station creek	5,000	.....	.....
Beaver creek	10,000	.....	.....
TRIBUTARIES OF ST. MARY'S RIVER:			
Lee creek	30,000	.....	.....
Tough creek	10,000	.....	.....
TRIBUTARIES OF CASTLE RIVER:			
Beaver Mines creek .....	.....	.....	5,000
Gladstone creek .....	.....	.....	12,000
Mill creek .....	.....	.....	12,000
Whitney creek .....	.....	.....	6,000
TRIBUTARIES OF CROWSNEST RIVER:			
Beauvis lake .....	.....	.....	5,500
Allison creek .....	.....	.....	10,000
Blairmore creek .....	.....	.....	10,000
Burmis creek .....	.....	.....	5,000
Byron creek .....	.....	.....	10,000
Crowsnest lake .....	.....	.....	20,000
Gold creek .....	.....	.....	10,000
McGillivray creek .....	.....	.....	5,000
Star creek .....	.....	.....	10,000
Pincher creek .....	.....	.....	30,000
WILLOW CREEK AND TRIBUTARIES:			
Burke creek .....	.....	.....	10,000
Johnson creek	25,000	.....	.....
Kuntz creek .....	.....	.....	5,000
Langford creek .....	.....	.....	5,000
Lyndon creek .....	.....	.....	20,000
Nelson creek .....	.....	.....	5,000
North Fork Willow creek	20,000	.....	.....
Patterson creek .....	.....	.....	5,000
Rice creek	10,000	.....	.....
Riley creek .....	.....	.....	5,000
South Fork Willow creek .....	.....	.....	15,000
Trout creek .....	.....	.....	20,000
TRIBUTARIES OF WATERTON RIVER:			
Carpentier creek .....	.....	.....	10,000
Cottonwood creek .....	.....	.....	10,000
Drywood creek .....	.....	.....	15,000
Pine creek .....	.....	.....	15,000
Trail creek .....	.....	.....	5,000
Yarrow creek .....	.....	.....	10,000
TOTAL.....	655,000	.....	305,500

BANFF

TRIBUTARY OF BATTLE RIVER:

Pigeon lake	40,000
-------------------	--------	-------

TRIBUTARIES OF RED DEER RIVER:

Birch lake	30,000	.....
Dobbs lake	10,000	.....
Horseshoe lake, No. 1	10,000	.....
Horseshoe lake, No. 2	5,000	.....
Rainy lake	15,000	.....
Bearberry creek	15,000	.....
Smith's creek	10,000	.....
Castle creek	200	.....

Name of Waters	Cutthroat	Loch Leven	Rainbow
Bear creek .....	.....	10,000	.....
Beaver Spring creek .....	.....	10,000	.....
Dogpound creek .....	.....	15,000	.....
Swanson creek .....	.....	5,000	.....
Road creek .....	.....	9,680	.....
Raven river .....	.....	24,800	.....
Beaver lake .....	.....	15,000	.....
Spring creek .....	.....	15,000	.....
Twin Spring creek .....	.....	5,000	.....
Wammick lake, No. 1 .....	.....	10,000	.....
Wammick lake, No. 2 .....	.....	5,000	.....
Wammick lake, No. 3 .....	.....	5,000	.....
Wammick lake, No. 4 .....	.....	5,000	.....
Wammick lake, No. 5 .....	.....	5,000	.....
TRIBUTARIES OF NORTH SASKATCHEWAN RIVER:			
Brule creek .....	.....	6,000	.....
Chambers creek .....	.....	15,000	.....
Lawrence creek .....	.....	12,000	.....
Ruth creek .....	.....	12,000	.....
Alfred creek .....	.....	10,000	.....
Muskeg creek .....	.....	5,000	.....
Prairie creek .....	.....	5,000	.....
Sucker lake .....	.....	10,000	.....
Suhr creek .....	.....	10,000	.....
Shunda creek .....	.....	10,000	.....
Fish lake .....	.....	10,000	.....
Wabamun lake .....	.....	40,000	.....
TRIBUTARIES OF BOW RIVER:			
Big Hill creek	30,000	.....	.....
Chiniki lake	25,000	.....	.....
Exshaw lakes	25,000	.....	.....
Gapp creek	5,000	.....	.....
Eau Claire creek	18,000	.....	.....
Haymeadow creek	30,000	.....	.....
Jumpingpound creek	25,000	.....	.....
Bear creek	10,000	.....	.....
Muskeg creek	10,000	.....	.....
Sibbald creek	15,000	.....	.....
Spring creek	10,000	.....	.....
Policeman creek	25,000	.....	.....
Spencer creek	15,000	.....	.....
Cold creek	25,000	.....	.....
TRIBUTARIES OF ELBOW RIVER:			
Crawford creek	5,000	.....	.....
Lotts creek	5,000	.....	.....
Mays creek	10,000	.....	.....
Mickel creek	5,000	.....	.....
Pirmez creek	10,000	.....	.....
Rennick creek	5,000	.....	.....
Stringer creek	5,000	.....	.....
Young creek	5,000	.....	.....
TRIBUTARIES OF HIGHWOOD RIVER:			
Etherington creek .....	.....	.....	19,380
Flat creek .....	.....	.....	20,000
Pekisko creek .....	.....	.....	20,000
Sullivan creek .....	.....	.....	20,000
TOTAL	318,000	419,680	79,380

JASPER

TRIBUTARIES OF ATHABASCA RIVER:			
Moose creek .....	.....	.....	5,000
Hargwin creek .....	.....	.....	5,000
Bench creek .....	.....	.....	15,000
Carrot creek .....	.....	.....	10,000
Edson creek .....	.....	.....	10,000
Mary Gregg lake .....	.....	.....	10,000
Sundance creek .....	.....	.....	10,000
Hornback creek .....	.....	.....	12,680
Horse creek .....	.....	.....	15,000
Unnamed creek .....	.....	.....	10,000
Wolfson creek .....	.....	.....	5,000
Reflection lake .....	.....	.....	20,000
Zanzell lake .....	.....	.....	10,000
TRIBUTARIES OF PEMBINA RIVER:			
Little Pembina river, township 57 .....	.....	.....	10,000
Little Pembina river, township 46 .....	.....	.....	5,000

TRIBUTARIES OF EMBARRAS RIVER:

Name of Waters	Cutthroat	Loch Leven	Rainbow
Chance creek	5,000
Dummy creek	5,000
Lost creek	5,000
Mitchell creek	5,000
Unnamed creek, township 49	5,000
Unnamed creek, township 48	5,000
TOTAL	182,690

RECAPITULATION

	Cutthroat	Loch Leven	Rainbow
Waterton hatchery	655,000	.....	305,500
Banff hatchery	318,000	419,680	79,380
Jasper hatchery .....	.....	.....	182,690
TOTALS	973,000	419,680	567,570

Cutthroat trout	973,000
Loch Leven trout	419,680
Rainbow trout	567,570

Total trout distributed from the three hatcheries 1,960,250

To be assured of the necessary supply of trout eggs for the next season's operations, arrangements must be made not later than August of the previous year. For next season's work, through better co-operation, it has been possible to secure a larger amount of eggs at less cost to the Government than heretofore, making it possible to extend all operations. Arrangements have been made for the following eggs to be hatched in the various hatcheries, the resultant fry to be liberated in provincial waters:

Hatchery	Number	Species
Waterton.....	500,000	Rainbow trout
Waterton.....	500,000	Cutthroat trout
Banff.....	100,000	Speckled trout
Banff.....	500,000	Loch Leven trout
Banff.....	400,000	Cutthroat trout
Banff.....	450,000	Rainbow trout
Jasper.....	200,000	Rainbow trout
TOTAL	2,650,000	

It will be noticed that the allotment for the Jasper hatchery is small. The capacity of this temporary establishment is approximately 300,000, and the above number is all that can be handled in addition to what is required for the Park waters.

Speckled trout fry will be planted for the first time in Cold Lake this coming season, the Government of Saskatchewan and the Cold Lake Board of Trade co-operating to the extent of bearing part of the expense and furnishing free transportation by truck from Edmonton to the lake.

It should be mentioned that a greater interest is taken each year by the members of the various fish and game protective associations and others not connected with these organizations. Many who do not fish themselves are interested in securing fish in the streams for the pleasure of those who do. Much assistance is rendered by these people in supplying conveyances such as cars, teams and pack horses free of cost, enabling the Fisheries' staff to get the fry out in considerably less time and consequently in much better condition.

The season's operations at the Lesser Slave Lake whitefish hatchery were again most satisfactory, although an increase is shown in the percentage of loss in eggs as compared with the previous year. This may be due to several reasons such as the class

or age of fish from which the eggs were taken, the care in taking the eggs, the condition of the trail or road over which they had to be transferred by wagon or truck, approximately 125 miles to the hatchery, the temperature of the weather during transportation or the way in which they were handled by those in charge of the teams and trucks. It is impossible to discover or blame any particular cause unless the actual attendance of an official through all stages of operations were put into effect.

On the first of April there were in the hatchery 122,000,000 eyed eggs, meaning eggs developed to the stage when the eye of the fish is showing and close to hatching. These eggs and resultant fry were disposed of as follows:

April 11th—10,400,000 eyed eggs returned to Whitefish lake, the main source of supply.

April 13th—5,000,000 eggs planted in lake Newell south of Brooks.

April 27th—5,000,000 planted in Buck lake near Caslin.

Total eyed eggs planted, 20,400,000. The balance of the eggs began hatching during the week ending April 23rd, and was finished by May 15th. A total of 101,700,000 fry was liberated in Lesser Slave lake, distribution starting on April 29th. The work was completed on May 20th.

It was intended that a planting of eggs should be made in Calling and Fork lakes, but owing to the late spring the eggs were too far advanced to permit of transfer by the time the ice had sufficiently disappeared to allow successful planting, and later the road was impassable for trucks when the fry were in condition for distribution. The possibility of using aeroplanes was considered, but the cost of transferring fry in this manner was prohibitive. The space required to handle 10,000,000 eggs would only carry 250,000 fry.

Immediately the distribution was completed the equipment as usual was cleaned and put in condition and the temporary staff dismissed. Any necessary repairs were done by the permanent staff during the summer. Some 600 shipping trays were overhauled and re-covered where necessary, part of the foundation of the hatchery, which had given way, was replaced, as well as part of the floor, and all equipment put in readiness for next season's operations. Ice damages to the hatchery wharf were also repaired during the summer.

Preparations for the fall collection of eggs were started on Lesser Slave lake during the last week of September and at Whitefish lake during the week ending October 8th. Camps were established on the north shore of Lesser Slave lake and at Whitefish river and the necessary temporary men were employed. Pound nets and traps were set and arrangements made for the taking of spawn and for its safe transportation to the hatchery.

The collection at each point was successful, as the following table will show:

Total collections, Whitefish lake	146,375,000	
Planted in Whitefish lake	8,000,000	
Planted in Whitefish river	11,600,000	
Planted in Calling lake	13,650,000	
Planted in Lesser Slave lake	1,550,000	
Placed in hatchery	111,575,000	
Loss to March 31st, 1933	15,600,000	
Balance in hatchery at end of year.....		95,975,000
Egg collection Lesser Slave lake	21,625,000	
Loss to March 31st, 1933	2,615,000	
Balance in hatchery at end of year.....		19,010,000
TOTAL BALANCE, BOTH SOURCES, AT END OF YEAR.....		<u>114,985,000</u>

During the season twenty lakes or small bodies of water were examined to ascertain their suitability for fish. Sixteen were found to be barren and four to contain fish-life. Three of the sixteen which were barren were suitable for pike, perch and pickerel whilst two others were only fit for perch. One of the four, in which there already existed perch and pike, will be stocked with whitefish. The remaining three contained perch only, one of them being unsuitable for any other species. The balance of the waters examined was considered unsatisfactory for any fish-life, being in every instance too shallow and in many cases too strong in mineral content.

In addition to the above examinations, the following lakes were stocked for the first time, some by transfer of perch, pickerel and pike from other lakes, the balance with trout fry or whitefish eggs from the hatcheries:

Lessard lake	Perch
Youngers lake	Perch, pike and pickerel
Pats lake	Perch, pike and pickerel
Jackfish lake	Perch, pike and pickerel
Sara lake	Perch, pike and pickerel
God's lake	Perch, pike and pickerel
Romeo lake	Perch and pickerel
Thunder lake	Perch and pickerel
Muir lake	Perch
Lake Newell	Whitefish eyed eggs
Buck lake	Whitefish eyed eggs
Whitefish lake	Whitefish eyed eggs
Calling lake	Fertilized eggs
Zanzell lake	Rainbow fry
Reflection lake	Rainbow fry
Mary Gregg lake	Rainbow fry
Pigeon lake	Loch Leven fry
Dobbs lake	Loch Leven fry
Horseshoe lakes, Nos. 1 and 2.....	Loch Leven fry
Rainy lake	Loch Leven fry
Beaver lake, No. 1.....	Loch Leven fry
Wammick lakes, Nos. 1 to 5	Loch Leven fry

A further allotment of Loch Leven fry was also liberated into Wabamun and Birch lakes as a continuation of the experiments to determine if this class of fish would exist with pike, perch and whitefish.

The examination of lakes will be continued and the stocking of those found suitable for fish will be carried out as quickly as possible. The many activities of the small staff of the Fisheries Division make it impossible to detail anyone for this duty alone. The work must be carried out when time will permit, and as the examinations can only be satisfactorily made during the summer months, progress is naturally slow. It might be mentioned, however, that special examinations have been made of some 250 bodies of water within the last few years in addition to those already known to be suitable, and a large percentage of those found adaptable to fish has been stocked.

It is gratifying to report that the restocking of streams and introduction of new species of fish into the waters of Alberta have met with much greater success than anticipated. This is evidenced especially with regard to the introduction of Rainbow trout into the streams in southern Alberta where previously none of this species existed and where excellent catches are now taken with single specimens weighing over four pounds. Many testimonials have been received from anglers verifying these statements.

It is hoped that when conditions improve there will be considerable expansion in this work.

DEPARTMENT OF LANDS AND MINES

RECORD OF LICENSES ISSUED AND SOLD
FISCAL YEAR, APRIL 1st, 1932 TO MARCH 31st, 1933

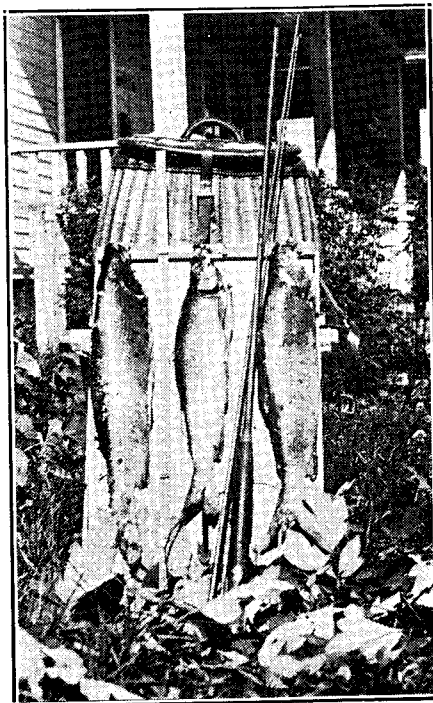
Month	Domestic	Fisher- man's	Com- mercial	Angling Permit	Indian Permit	Total
April	5	2	...	...	425	432
May	56	66	1	83	110	316
June	63	23	...	1,144	2	1,232
July	24	14	7	1,703	207	1,955
August	31	25	14	1,037	...	1,107
September	17	44	3	573	...	637
October	2	3	...	361	107	473
November	20	37	7	54	9	127
December	176	147	1	8	...	332
January	46	163	2	...	...	211
February	12	25	1	...	...	38
March	6	13	...	...	...	19
TOTALS.....	458	562	36	4,963	860	6,879

In addition to the above, the Forestry Division sold, on behalf of the
Fisheries, Angling Permits 478

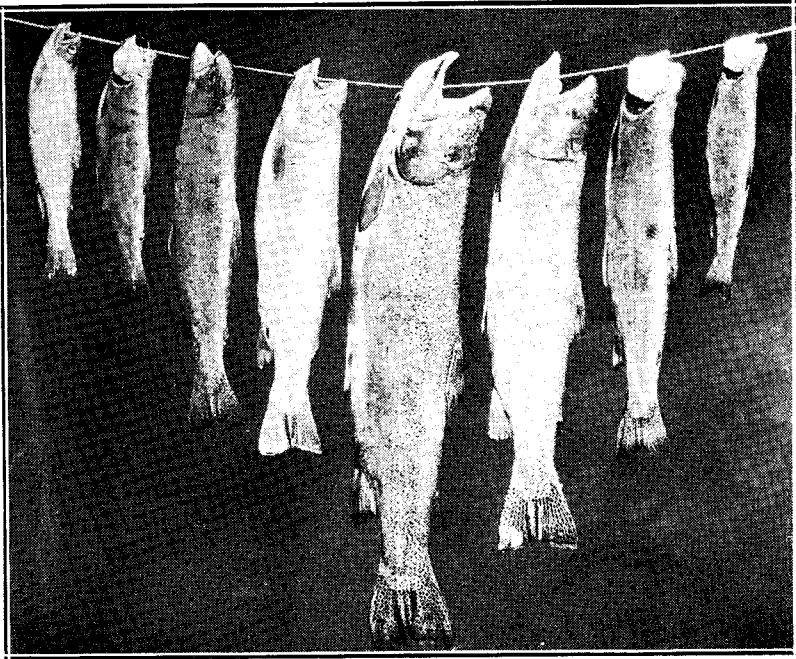
GRAND TOTAL..... 7,357

ITEMIZED REVENUE OBTAINED DURING FISCAL YEAR
APRIL 1st, 1932-MARCH 31st, 1933

Month	Fisherman's License	Domestic License	Commercial License	Angling Permits	Sales	Sundry	Total
April	\$ 10.00	\$ 10.00	.....	.....	\$ 12.14	.....	\$ 32.14
May	330.00	112.00	\$ 10.00	\$ 166.75	12.00	\$ 71.14	701.89
June	115.00	126.00	.....	2,293.50	39.50	16.66	2,590.66
July	70.00	48.00	70.00	3,427.25	2.65	16.66	3,634.56
August	125.00	62.00	140.00	2,099.75	111.75	16.66	2,555.16
September	220.00	34.00	30.00	1,151.00	10.50	16.66	1,462.16
October	15.00	4.00	.....	742.75	10.00	20.31	792.06
November	185.00	40.00	70.00	108.50	4.50	16.66	424.66
December	735.00	352.00	10.00	16.00	100.65	16.66	1,230.31
January	815.00	92.00	20.00	.....	28.55	16.66	972.21
February	125.00	24.00	10.00	.....	36.93	16.66	212.59
March	65.00	12.00	.....	.....	30.04	24.16	131.20
TOTALS.....	\$2,810.00	\$916.00	\$360.00	\$10,005.50	\$399.21	\$248.89	\$14,739.60



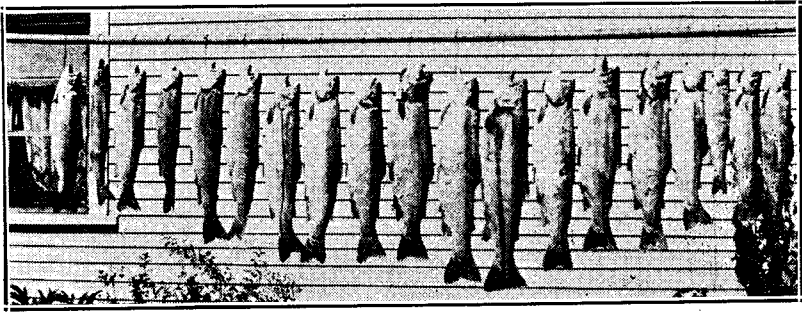
Arctic grayling caught in August, 1933, in the Christina river near Conklin,
north of Lac la Biche



Rainbow trout caught in September, 1932, in the Bow river near the mouth of the Highwood river. The largest of this group weighed four pounds. This species, non-indigenous to these waters, was previously stocked in this area.



Spawn collecting—cutthroat trout. Spray Lakes.



Rainbow and cutthroat trout— $\frac{3}{4}$ lb. to $2\frac{1}{2}$ lbs.—caught in September, 1933, on the Bow river near Dalemead.

BIRD SANCTUARIES AND PUBLIC SHOOTING GROUNDS

Upon the transfer of the natural resources to the Province the bird sanctuaries and shooting grounds established under the Migratory Birds Convention Act as nesting and resting places were included. The care of these sanctuaries and shooting grounds was placed with this Division, all permanent officers having, prior to the transfer, been appointed migratory bird officers to assist in the enforcement of the Act in conjunction with the Royal Canadian Mounted Police. No difficulty was experienced in taking over control.

In addition to five small areas privately or municipally owned and declared sanctuaries under the above mentioned Act, there are six large ones directly controlled by this Department, as well as 32 public shooting grounds.

The consensus of opinion points to the creation of sanctuaries for the protection of migratory birds as a general benefit. The water areas in two of these districts, which were established during more favourable seasons, have gone dry, however, and will be of little use until wet seasons occur again and the lakes come back to normal. The other four are in good condition.

These sanctuaries have become resting places for great numbers of ducks, geese and other water fowl during their migration as well as nesting areas and places of protection from the hunter.

A number of metal and wood signs have been made warning against hunting or molesting birds or their nests in any way. These have been placed at various points around the sanctuaries. Lighting fires or cutting timber on any sanctuary is also prohibited, although during the season two small fires were started, and while the total area burned was less than half an acre some difficulty was experienced in controlling them, trenching being necessary.

The sanctuaries are patrolled by the various officers in whose districts they are located to see that laws are observed in the prevention of trespassing or other violation.

The public shooting grounds were established for the purpose of assuring sportsmen of a permanent place to hunt game birds during the open seasons. A great many of the larger of these might also be classed as sanctuaries as the large lakes of which they are chiefly comprised furnish resting places difficult to be reached by the hunter, and the shore vegetation supplies excellent cover for nesting birds in the spring of the year when no shooting is permitted.

Accounting Division

REPORT OF THE ACTING ACCOUNTANT, I. N. McKINNON

A surplus of \$289,616.15 on income account was shown for the fiscal year ending March 31, 1933, a decrease of \$52,242.91 from the previous year. Revenue showed a decrease of \$170,829.91 which was partially offset by a decrease of \$118,587.00 in expenditure. Total revenue was \$861,477.66 and the total expenditure was \$571,861.51. The actual decrease in revenue collections from the previous fiscal year was \$18,784.84, the sum of \$152,045.07, 1930-31 School Lands collections, having been included in the revenue for the year 1931-32.

Total cash received from all sources amounted to \$968,929.06, particulars of which are given in statements "A" and "B".

LAND PATENTS BRANCH

Homestead Entries.

Homestead entries granted showed a decrease of 929, with a corresponding decrease in revenue. Total number granted was 3,499, covering an area of approximately 559,840 acres. Details of entries granted will be found in statement "N".

Land Sales.

Collections on principal and interest were \$7,524.85 and \$5,280.87, respectively, there being a decrease of \$932.75 in principal and an increase of \$2,729.34 in interest collected from the previous year.

Details of collections for this branch are given under statement "D".

TIMBER AND GRAZING BRANCH

Timber.

Receipts from timber operations amounted to \$112,485.45 as compared with \$150,262.60 for the previous year, a decrease of \$37,777.15. Timber products manufactured by holders of license and permit berths were as follows:

Board measure lumber manufactured	45,375,413
Railway ties	189,180
Piling (lineal feet)	560
Laths	3,962,605
Mine timber (lineal feet)	137,464
Logs (lineal feet)	6,168

In addition to the above, 277,631 feet board measure of lumber were manufactured on school lands berths. A considerable amount of lumber was cut under miscellaneous permits, including 77,568 railway ties. Another 25,011 ties were cut under trespass.

Grazing.

Receipts from grazing leases and permits amounted to \$37,429.94, a decrease of \$4,551.27 from the previous year. Leases in force number 3,708, covering 3,172,839 acres.

Details of collections for this branch will be found under statement "E".

MINING LANDS BRANCH

Coal Leases.

Revenue for the year was \$269,820.20, including royalty of \$143,800.01, a decrease of \$5,267.46 from the previous year. Figures include receipts from coal mined under road allowances.

Royalties on coal mined on sales and Crown leases showed a slight increase from the previous year, though total production mined in the Province showed a decrease of 201,111 tons, 4,681,864 tons being mined this year as against 4,882,975 for the previous year. Leases in force number 517, covering 173,414.61 acres.

Petroleum and Natural Gas.

Collections on both rental and royalty again showed decreases. Rentals collected were \$42,219.51 as against \$57,711.87 for the previous year, a decrease of \$15,452.36. Royalty collected was \$73,182.96 as compared with \$106,103.05 for the previous year. This is in line with a decrease in naphtha and oil production on Crown lands of 299,496 barrels. Total production for this year was 486,221 barrels as against 785,717 barrels for the previous year. Leases in force number 11,149, covering an acreage of 1,680,688.

Details of revenue collected by this branch are given under statement "F".

SCHOOL LANDS BRANCH

No sales of school lands by public auction were held during the past fiscal year. Collections on sales indicate a substantial increase over the previous year. While payments on account of principal show a decrease of \$3,882.04, interest collections reveal an increase of \$104,024.21. Receipts on account of principal were \$40,065.81 and interest \$162,875.81.

Total school lands receipts for the year amounted to \$262,891.94 as compared with \$164,036.80 for the previous year. Complete details of receipts are given in statement "G".

The Alberta School Lands Sales Trust Account as at March 31st, 1933, amounted to \$16,734,235.74, particulars of which will be found in statement "H".

Arrears of interest on sales as at March 31st, 1933, amounted to \$2,237,264.92 as compared with \$2,228,014.55 as at March 31st, 1932, details of which are given in statement "I".

The Department, during the past year, made a careful survey of all sales accounts which were in arrears. It was decided to give purchasers the opportunity of giving up their sales contracts and retaining their land under a cultivation permit following which a lease would be granted, cultivation leases and permits to be obtained at an annual rental of 4c per acre on the uncultivated area plus a share of the crop, the Department refunding to the lessee taxes paid on the cultivated area. Purchasers in arrears retaining their contracts were required to give the Department a crop lease, resulting in the large increase in interest collections.

FORESTRY BRANCH

Collections of revenue from the various Forest Reserves amounted to \$32,762.33, a decrease of \$10,766.53 from the previous year. Complete details of receipts will be found in statement "J".

FISHERIES BRANCH

Collections amounted to \$14,739.60 as compared with \$18,861.22 for the previous year, a decrease of \$4,121.62. Details of receipts are given in statement "K".

MINES ACT BRANCH

Receipts for the year amounted to \$6,968.37, details of which will be found in statement "L".

INDEX TO STATEMENTS

- A.—Statement of Cash Receipts by Branches.
- B.—Statement of Cash Receipts from all sources.
- C.—Statement of Cash Receipts by Agencies.
- D.—Statement of Cash Receipts, Land Patents Branch.
- E.—Statement of Cash Receipts, Timber and Grazing Branch.
- F.—Statement of Cash Receipts, Mining Lands Branch.
- G.—Statement of Cash Receipts, School Lands Branch.
- H.—Statement of School Lands Trust Balance Sheet.
- I.—Statement of Alberta School Lands Sales Revenue Account.
- J.—Statement of Cash Receipts, Forestry Service.
- K.—Statement of Cash Receipts, Fisheries Branch.
- L.—Statement of Cash Receipts, Administration of The Mines Act Branch.
- M.—Statement of Collections on Tax Recovery Lands.
- N.—Statement of Homestead Entries Granted.
- O.—Statement of Statistical Summary of Nationalities.

STATEMENT A

STATEMENT OF CASH RECEIPTS BY BRANCHES

FOR PERIOD APRIL 1, 1932 TO MARCH 31, 1933

Land Patents Branch	\$ 69,729.30	
Timber and Grazing Branch	154,538.91	
Mining Lands Branch	390,646.76	
School Lands Branch	262,891.94	
Forestry Branch	32,762.33	
Fisheries Branch	14,739.60	
Petroleum and Natural Gas Division	430.64	
Administration of the Mines Act Branch	6,968.37	
Administration Revenue (Miscellaneous Fees)	213.00	
Tax Recovery Branch	12,215.05	
Total Cash Receipts Allocated		\$945,135.90
Unapplied receipts and monies subject to refund, carried forward from previous year	\$36,319.67	
Less Suspense applied and refunded	12,526.51	
		23,793.16
TOTAL CASH RECEIPTS.....		<u>\$968,929.06</u>

STATEMENT B

STATEMENT OF CASH RECEIPTS FROM ALL SOURCES

FROM APRIL 1, 1932 TO MARCH 31, 1933

	Gross Receipts	Refunds	Net Revenue
INCOME ACCOUNT:			
Homestead Fees	\$ 34,680.00	\$ 30.00	\$ 34,650.00
Improvement Collection Fees	2,418.55	.....	2,418.55
Unclaimed Improvements	5,809.31	.....	5,809.31
Cancellation Fees	2,750.00	10.00	2,740.00
Filing Authority Fees	2,572.00	6.00	2,566.00
General Sales: Interest	5,280.87	.....	5,280.87
Cultivation Fees, Rentals, etc.	457.31	9.10	448.21
Surface Rentals	2,190.34	.....	2,190.34
Canmore Rental Account	1,276.01	.....	1,276.01
Land Patents Sundry	2,220.84	5.75	2,215.09
Fur Farm Fees, Rentals, etc.	334.61	25.00	309.61
Timber Permits, Fees, Dues, etc.	128,354.76	4,647.40	123,707.36
Grazing Fees, Rentals, etc.	49,528.93	549.28	48,979.65
Hay Permits, Fees, Dues, etc.	2,734.86	35.00	2,699.86
Timber and Grazing Miscellaneous	2,818.01	12.50	2,805.51
Mines Act Sundry Revenue	4,840.16	93.00	4,747.16
Coal Fees, Rentals, etc.	126,020.19	269.70	125,750.49
Coal Mining Royalty	143,800.01	.....	143,800.01
Petroleum and Natural Gas Fees, Rentals, etc.	42,259.51	226.81	42,032.70
Petroleum and Natural Gas Drilling Permits	85.00	.....	85.00
Petroleum and Natural Gas Royalty	73,182.96	.....	73,182.96
Quarrying Lease Fees and Rentals	1,032.22	.....	1,032.22
Mining Lands Sundry Revenue	1,223.52	40.68	1,182.84
Fishing Licenses	4,086.00	.....	4,086.00
Angling Permits	11,093.00	.....	11,093.00
Fisheries Sundry Revenue	648.10	.....	648.10
Administration Sundry Revenue	202.08	.....	202.08
Reimbursement of Salaries and Expenses	210.92	.....	210.92
School Lands Sales Interest	162,875.81	49.13	162,826.68
School Lands Miscellaneous	52,748.32	247.19	52,501.13
TOTAL INCOME ACCOUNT	\$867,734.20	\$ 6,256.54	\$861,477.66
CAPITAL ACCOUNT:			
Lands Sales: Principal	7,524.85	2.00	7,522.85
TOTAL INCOME AND CAPITAL ACCOUNTS	\$875,259.05	\$ 6,258.54	\$869,000.51
UNAPPLIED RECEIPTS CARRIED FORWARD: (Subject to Refund)			
Improvements	18,140.42	8,321.82	9,818.60
Suspense	9,555.94	.....	9,555.94
School Lands Cultivation Crop Shares	5,810.60	48.98	5,761.62
Land Patents Cultivation Lease Fees	240.00	5.00	235.00
School Lands Cultivation Lease Fees	1,391.40	25.00	1,366.40
.....	<u>\$910,397.41</u>	<u>\$ 14,659.34</u>	<u>\$895,738.07</u>
TRUST ACCOUNTS:			
School Lands Trust Fund	40,065.81	.....	40,065.81
Petroleum and Natural Gas Cash Bonds	5,402.20	.....	5,402.20
Homesteaders' Trust Monies	848.59	.....	848.59
Tax Recovery Lands Trust Account	12,215.05	.....	12,215.05
TOTAL CASH RECEIPTS	\$968,929.06	.....	.....

STATEMENT C

STATEMENT OF CASH RECEIPTS BY AGENCIES

APRIL 1, 1932 TO MARCH 31, 1933

	Land Patents Branch	Timber and Grazing Branch	Mining Lands Branch	School Lands Branch	Total
Edmonton	\$ 38,862.49	\$102,247.37	\$116,341.49	\$107,422.73	\$364,874.08
Calgary	5,717.91	20,329.28	210,793.57	106,032.37	342,873.13
Grande Prairie	7,764.04	4,024.06	445.70	7,117.19	19,350.99
Lethbridge	5,196.28	23,363.40	62,846.23	36,253.82	127,659.73
Peace River	12,188.58	4,574.80	219.77	6,065.66	23,048.81
Administration Office .....	.....	.....	.....	.17	.17
	<u>\$ 69,729.30</u>	<u>\$154,538.91</u>	<u>\$390,646.76</u>	<u>\$262,891.94</u>	<u>\$877,806.91</u>

N.B.—Monies which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT D

LAND PATENTS BRANCH
STATEMENT OF CASH RECEIPTS
APRIL 1, 1932 TO MARCH 31, 1933

	Edmonton	Calgary	Grande Prairie	Lethbridge	Peace River	Total
Homestead Fees	\$23,230.00	\$ 20.00	\$ 4,640.00	.....	\$ 6,790.00	\$34,680.00
Improvements	6,187.06	127.50	1,987.75	557.15	3,271.60	12,131.06
Cancellation Fees	1,804.00	.....	392.00	.....	554.00	2,750.00
Filing Authority Fees	1,584.00	104.00	338.00	42.00	504.00	2,572.00
General Sales: Principal	4,367.39	814.36	217.37	1,776.73	349.00	7,524.85
General Sales: Interest	323.70	2,262.86	43.57	2,323.35	321.39	5,280.87
Cultivation Fees, Rentals, etc.	20.55	460.86	.....	212.40	13.50	697.31
Surface Rentals	2.00	77.06	.....	140.00	.....	219.06
Canmore Rental Account .....	.....	1,276.01	.....	.....	.....	1,276.01
Land Patents: Miscellaneous	687.68	358.31	120.35	128.65	119.95	1,414.34
Homesteaders' Trust Monies	580.56	201.95	.....	10.00	56.08	848.59
Fur Farm Fees and Rentals	75.55	25.00	25.00	.....	209.06	334.61
	<u>\$38,862.49</u>	<u>\$ 5,717.91</u>	<u>\$ 7,764.04</u>	<u>\$ 5,196.28</u>	<u>\$12,188.58</u>	<u>\$69,729.30</u>

N.B.—Monies which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT E

TIMBER AND GRAZING BRANCH
STATEMENT OF CASH RECEIPTS
APRIL 1, 1932 TO MARCH 31, 1933

	Edmonton	Calgary	Grande Prairie	Lethbridge	Peace River	Total
Timber: Fees, Dues, Royalty, etc.	\$ 97,602.67	\$ 8,584.21	\$ 3,393.57	\$ 15.00	\$ 2,890.00	\$112,485.45
Grazing: Fees, Rentals, etc.	2,183.84	10,776.91	314.99	23,042.65	1,111.55	37,429.94
Hay: Fees, Dues, etc.	1,313.73	309.13	303.00	32.75	568.25	2,526.86
Timber and Grazing: Miscellaneous	1,147.13	659.03	12.50	273.00	5.00	2,096.66
	<u>\$102,247.37</u>	<u>\$20,329.28</u>	<u>\$ 4,024.06</u>	<u>\$23,363.40</u>	<u>\$ 4,574.80</u>	<u>\$154,538.91</u>

N.B.—Monies which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT F

MINING LANDS BRANCH

STATEMENT OF CASH RECEIPTS

APRIL 1, 1932 TO MARCH 31, 1933

	Edmonton	Calgary	Grande Prairie	Lethbridge	Peace River	Total
Coal Fees, Rentals, etc.	\$ 53,972.14	\$ 58,186.59	\$ 295.90	\$13,659.56	\$ 46.00	\$125,470.19
Coal Royalty	55,564.32	54,763.91	119.80	32,043.72	30.05	142,221.80
Petroleum and Natural Gas: Fees, Rentals, etc.	6,897.43	23,123.79		12,111.07	141.22	42,221.51
Petroleum and Natural Gas: Royalties	4.75	71,479.23		1,698.98		73,182.96
Petroleum and Natural Gas: Cash Bonds		2,304.00		3,098.20		5,402.20
Quarrying Fees, Rentals, etc.	248.77	639.90		38.55		1,032.22
Miscellaneous	714.08	240.15	30.00	131.15	2.50	1,117.88
	<u>\$116,341.49</u>	<u>\$210,793.57</u>	<u>\$ 445.70</u>	<u>\$62,846.23</u>	<u>\$ 219.77</u>	<u>\$390,646.76</u>

N.B.—Monies which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT G

SCHOOL LANDS BRANCH

STATEMENT OF CASH RECEIPTS

APRIL 1, 1932 TO MARCH 31, 1933

	Edmonton	Calgary	Grande Prairie	Lethbridge	Peace River	Administration Office	Total
Sales: Principal	\$ 18,207.80	\$ 18,049.30	\$ 594.32	\$ 2,929.91	\$ 834.47		\$ 40,065.81
Sales: Interest	71,695.41	65,896.87	4,884.90	16,121.80	4,476.83		162,875.81
Cultivation Fees, Rentals, etc.	4,626.77	4,722.46	47.00	1,091.60	71.60		10,559.43
Surface Rentals				19.98			19.98
License of Occupation and Special Leases	1.00	82.69		5.00			88.69
Timber Fees, Dues, Royalties, etc.	6,286.21	302.05	1,156.52	13.75	44.56		7,803.09
Grazing Fees, Rentals, etc.	4,695.52	10,086.17	347.95	9,346.63	443.19		24,919.46
Hay Fees, Dues, etc.	540.25	97.00	61.50	15.50	145.00		859.25
Coal Fees, Rentals, etc.	320.55	3,452.24		2,337.78			6,110.57
Coal Mining Royalties	360.30	1,049.49		3,561.99			4,971.78
Petroleum and Natural Gas: Fees, Rentals, etc.	372.38	2,116.68		1,229.88			3,718.94
Royalties	11.04	242.42					253.46
Registration and Assignment Fees	285.00	135.00	25.00	83.00			528.00
Miscellaneous	20.50			97.00		.17	117.67
	<u>\$107,422.73</u>	<u>\$106,032.37</u>	<u>\$ 7,117.19</u>	<u>\$36,253.82</u>	<u>\$ 6,065.66</u>	<u>\$.17</u>	<u>\$262,891.94</u>

N.B.—Monies which were paid direct to Administration Office have been allocated to the Agency concerned.

STATEMENT H

ALBERTA SCHOOL LANDS TRUST FUND
BALANCE SHEET—MARCH 31, 1933

ASSETS		
Cash in Bank	\$	4,223.59
Investments:		
Dominion of Canada 5% Debentures	\$9,564,569.20	
Other Debentures	112,809.66	
		9,677,378.86
Accrued Interest		357.14
Accounts Receivable:		
Undue Principal	\$4,580,244.78	
Arrears Principal	2,472,040.41	
		7,052,285.19
		<u>\$16,734,244.78</u>
LIABILITIES		
Alberta School Lands Trust Account	\$16,734,235.74	
Suspense	9.04	
		<u>\$16,734,244.78</u>

STATEMENT I

ALBERTA SCHOOL LAND SALES
REVENUE ACCOUNT

FOR THE PERIOD APRIL 1, 1932 TO MARCH 31, 1933

Arrears interest as at March 31, 1932	\$2,228,014.55	
Interest charged during period	668,971.16	
Cash Collections during period		\$ 162,826.68
Interest on Cancelled sales written off		496,894.11
Arrears interest as at March 31, 1933		2,237,264.92
	<u>\$2,896,985.71</u>	<u>\$2,896,985.71</u>

STATEMENT J

FORESTRY SERVICE
STATEMENT OF CASH RECEIPTS
 FROM APRIL 1, 1932 TO MARCH 31, 1933

LAND PATENTS BRANCH:		
Surface Rentals	\$	1,971.28
Miscellaneous Use Permits		805.90
TIMBER AND GRAZING BRANCH:		
Timber Fees, Dues, Royalty, etc.		15,869.31
Grazing Fees, Rentals, etc.		12,098.99
Hay Fees, Dues, etc.		208.00
Miscellaneous		721.35
FISHERIES BRANCH:		
Angling Permits		1,087.50
		<u>\$32,762.33</u>

STATEMENT K

FISHERIES BRANCH
STATEMENT OF CASH RECEIPTS
 FROM APRIL 1, 1932 TO MARCH 31, 1933

Angling Permits	\$10,005.50
Fishing Licenses	4,086.00
Sundry	648.10
	<u>\$14,739.60</u>

STATEMENT L

ADMINISTRATION OF THE MINES ACT BRANCH
STATEMENT OF CASH RECEIPTS
 FROM APRIL 1, 1932 TO MARCH 31, 1933

Certificate Fees	\$ 1,263.50
Sale of Report Books	837.66
Coal Sales Act, Registration Fees	40.00
Coal Leases (Road Allowance) Rental	550.00
Coal Leases (Road Allowance) Royalty	1,578.21
Examination Fees	1,438.00
Miscellaneous	1,261.00
	<u>\$6,968.37</u>

STATEMENT M

STATEMENT OF COLLECTIONS ON TAX RECOVERY LANDS

FROM APRIL 1, 1932 TO MARCH 31, 1933

Special Leases	\$ 1.00
Grazing Rentals, etc.	3,015.32
Grazing Permits	3,393.06
Cultivation Lease Fees	521.00
Cultivation Rentals	913.18
Grazing Bonus	7.52
Hay Permits	49.00
Improvements	789.05
Cultivation Crop Shares	3,437.98
Tax Recovery Sundry Revenue	26.00
Miscellaneous Rentals	31.94
Sales Principal	30.00
	<u>\$12,215.05</u>

STATEMENT N

HOMESTEAD ENTRIES GRANTED

FROM APRIL 1, 1932 TO MARCH 31, 1933

	Homesteads	Second Homesteads	Soldier Grants	TOTAL	Entries to Women
Edmonton Land Agency	2,043	257	23	2,323	569
Calgary Land Agency	2	.....	.....	2	1
Lethbridge Land Agency .....	.....	.....	.....	.....	.....
Grande Prairie Land Agency..	414	48	2	464	157
Peace River Land Agency	653	53	4	710	249
	<u>3,112</u>	<u>358</u>	<u>29</u>	<u>3,499</u>	<u>976</u>

Had Previous Entry—480.

The Homestead Revenue does not agree with the total entries granted due to Peace River Homestead Revenue for the period March 16th to 31st, amounting to \$310.00, not being received at Administration Office in time to be included in this year's revenue.

STATEMENT O

STATISTICAL SUMMARY OF NATIONALITIES

FROM APRIL 1, 1932 TO MARCH 31, 1933

Country of Origin	No. of Entries	No. of Souls
Canada	1,237	3,074
England	179	588
Scotland	69	213
Ireland	29	82
Wales	12	49
United States	456	1,627
Australia	2	5
Austria	75	309
Belgium	4	7
British Guiana	1	5
Czechoslovakia	69	214
Denmark	34	55
East Indies	1	2
Estonia	1	3
Finland	5	11
France	8	32
Galicia	1	6
Germany	84	192
Holland	15	44
Hungary	33	123
India	1	5
Italy	7	22
Jugo-Slavia	9	20
Lithuania	15	19
Newfoundland	4	9
New Zealand	2	9
Norway	71	204
Poland	325	1,027
Roumania	36	137
Russia	56	204
Sweden	65	158
Spain	1	3
Switzerland	13	31
Syria	1	5
Ukrania	191	653
	<u>3,112</u>	<u>9,147</u>

